SOVIET COMMERCIAL TECHNOLOGIES

INTERAGENCY TECHNOLOGY ASSESSMENT GROUP (ITAG)

Final Report

September 1990

Sponsor

Department of Commerce
Office of Foreign Availability
Bureau of Export Administration
14th & Pennslyvania Avenue, N.W.
Washington, D.C. 20230

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Members of the Department of Defense and the Department of Commerce have agreed to co-chair an Interagency Technology Assessment Group (ITAG) to develop a list of technologies where it is estimated that the Soviets lead Western accomplishments. This ITAG is chartered to bring together the appropriate U.S. technical interests which will facilitate U.S. industry access to Soviet technology. The result of this Group's activities is a report listing those Soviet scientific advances which may lead U.S. scientific capabilities. The purpose for developing this documentation is that while the USSR is going through this period of political transition and requiring hard currency for expanding their industrial capabilities, they are making their scientific advances available for purchase by the West at an unprecedented rate. It would be in the U.S.'s best interests (both government and industry) to examine these offerings and to procure these beneficial scientific advances while they are available for sale from the USSR. Report includes: Available Soviet Commercial Technologies; U.S. Organizations; USSR Organizations; U.S. - USSR Joint Venture Programs; and Soviet Commercial Technologies.

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SECTION I. EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

Members of the Department of Defense (DoD) and the Department of Commerce (DoC) have agreed to co-chair an Interagency Technology Assessment Group (ITAG) to develop a list of technologies where it is estimated that the Soviets lead western accomplishments. The ITAG's executive committee is composed of members from the Department of Commerce, Office of Foreign Availability, and Department of Defense, Office of Strategic Planning. This ITAG is chartered to bring together the appropriate U.S. technical interests which will facilitate U.S. industry access to Soviet technology. The result of this Group's activities is a report listing those Soviet scientific advances which may lead U.S. scientific capabilities. The Soviet technology can be measured in scientific (mathematical or physical) terms; or in business terms (cheaper to manufacture, less person-power intensive, etc.); or in both scientific and business terms. The purpose for developing this documentation is that, while the USSR is going through this period of political transition and requiring hard currency for expanding their industrial capabilities, they are making their scientific advances available for purchase by the West at an unprecedented rate. It would be in the U.S.'s best interests (both government and industry) to examine these offerings to procure these beneficial scientific advances while they are available for sale from the USSR.

The analytic approach used for developing this report was one of integrating existing knowledge and those data bases which have been and remain focused on available Soviet technology. Specifically, the process for evaluating available Soviet technology, from both the U.S. government and industry perspectives, has at least three orthogonal dimensions:

a. The scientific elements of each specific technology.
b. The engineering elements required for applying each specific technology.
c. The business elements required to benefit from commercialization of each specific technology.

SECTION II. AVAILABLE SOVIET COMMERCIAL TECHNOLOGIES

SOVIET COMMERCIAL TECHNOLOGIES LIST BY SIC CODE
-- SUMMARY --

SIC GROUP/SUB-GROUP TITLE	TOTAL
DIVISION B MINING	
12 COAL MINING	1
13 OIL AND GAS EXTRACTION	2
DIVISION D MANUFACTURING	
28 CHEMICALS AND ALLIED PRODUCTS	10
30 RUBBER AND MISCELLANEOUS PLASTICS PRODUCTS	6
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47 TRANSPORTATION SERVICES	2
49 ELECTRIC, GAS, AND SANITARY SERVICES	1
DIVISION I SERVICES	
87 ENGINEERING, ACCOUNTING, RESEARCH, MANAGEMENT, AND RELATED SERVICES	1
TOTAL REPORTED TECHNOLOGIES	77

SOVIET COMMERCIAL TECHNOLOGIES LIST

SIC GROUP 12: COAL MINING

BREAKAGE-FACE LONGWALL COAL-MINING MACHINE

SIC GROUP 13: OIL AND GAS EXTRACTION

EXTRACTION TECHNIQUES OF PETROLEUM PRODUCTS (THERMAL, GAS, POLYMER FLOODING)

(CONTINUED)

SOVIET COMMERCIAL TECHNOLOGIES LIST (CONTINUED)

SIC GROUP 28: CHEMICALS AND ALLIED PRODUCTS

ALUMINUM OXIDE PRODUCTION PROCESSES
CHLOROFLUOROCARBON PRODUCTION PROCESSES
LASANT MATERIALS (GARNET, ERBIUM:GLASS, Nd:GLASS)
MICROGRAVITY-PROCESSED BIOCRYSTALLIZERS
MICROGRAVITY-PROCESSED CELL-PRODUCENTS FOR FEED-STUFF VITAMINS AND ANTIBIOTICS
POLYURETHENE COMPOUNDS
PURIFIED MEDICAL PREPARATIONS
SELF-PROPAGATING HIGH-TEMPERATURE SYNTHESIS
SYNTHETIC RUBBER PRODUCTION PROCESSES (ISOPROPRENE, CHLOROPRENE)
TURBULENT REACTOR

SIC GROUP 30: RUBBER AND MISCELLANEOUS PLASTICS PRODUCTS

CARBON ADHESIVES
CARBON-CARBON PRODUCTS
COMPONERS
METAL SUPERPLASTICITY
ROLIVSANS THERMOSETTING CAST RESINS
STRUCTURAL CARBON AND ORGANIC FIBER REINFORCED PLASTICS AND THERMOPLASTICS (BORON-CARBON)

(CONTINUED)

SOVIET COMMERCIAL TECHNOLOGIES LIST (CONTINUED)

SIC GROUP 33: PRIMARY METAL INDUSTRIES

DYNAMIC COMPACTION SYNTHESIS
ELASTOMERIC ROLL FORMING OF SHEET METAL
FILAMENT WINDING OF THICK SECTION COMPOSITES FABRICATION PROCESSES
IMPULSE PROCESSING METHOD
PLASMA-MECHANICAL METAL PROCESSING
SPECIALTY STEEL PLASMA-CONDITIONING SYSTEMS
TITANIUM ALLOYS
VACUUM PROCESSING OF STEEL WITH SYNTHETIC SLAG AND INERT GASES
WELDABLE ALUMINUM-LITHIUM (Al-Li) ALLOYS

SIC GROUP 34: FABRICATED METAL PRODUCTS, EXCEPT MACHINERY AND TRANSPORTATION EQUIPMENT

ROTARY-PLANETARY MILL MACHINE
SMALL NUCLEAR POWER REACTORS

(CONTINUED)

SOVIET COMMERCIAL TECHNOLOGIES LIST (CONTINUED)

SIC GROUP 35: INDUSTRIAL AND COMMERCIAL MACHINERY AND COMPUTER EQUIPMENT

DIESEL ENGINES
FIBER OPTICS MODULE FOR AUTOMATIC CONTROL SYSTEMS
MULTIPLE-REFLECTION OPTICAL SYSTEMS
OPTICAL COMPUTING/ INFORMATION PROCESSING
WAVEGUIDE HOLOGRAMS

SIC GROUP 37: TRANSPORTATION EQUIPMENT

COMMERCIAL AIRCRAFT APPLICATIONS (IL-114, SUKHOI)
CRYOGENIC FUEL AIRCRAFT ENGINES
FAN-PROP AIRCRAFT ENGINES
GAS TURBINE HELICOPTER ENGINES
WING WITH INTERNAL FRAMEWORK (LATTICE CONTROL SURFACE OR GRID FIN)

(CONTINUED)

SOVIET COMMERCIAL TECHNOLOGIES LIST (CONTINUED)

SIC GROUP 36: ELECTRONIC AND OTHER ELECTRICAL EQUIPMENT AND COMPONENTS EXCEPT COMPUTER EQUIPMENT

DISK EXPLOSIVE MAGNETIC GENERATORS
ELECTRON-BEAM-PUMPED SEMICONDUCTOR LASERS
EXPLOSIVE MAGNETOHYDRODYNAMICS GENERATORS
HIGH BRIGHTNESS NEGATIVE ION SOURCES
HIGH MAGNETIC FIELD GENERATOR (SPS/VPS)
HIGH POWER GAS LASERS
HIGH POWER GLASS LASERS
HIGH POWER MICROWAVE GENERATORS
HIGH POWER RF HEATERS FOR IONOSPHERIC MODIFICATION
HIGH POWER RF TUBES
LASER INSTRUMENTATION
MAGNETIC FLUX COMPRESSION GENERATOR
MICROGRAVITY-PROCESSED ULTRA-PURE SEMICONDUCTOR SINGLE CRYSTALS (GaAs, Ge, CdTe, Si)
PULSED WAVE DE-ICING/ANTI-ICING EQUIPMENT
SPATIAL LIGHT MODULATORS
TACITRONS
VACUUM MICROELECTRONICS

(CONTINUED)

SOVIET COMMERCIAL TECHNOLOGIES LIST (CONTINUED)

SIC GROUP 38: MEASURING, ANALYZING, AND CONTROLLING INSTRUMENTS: PHOTOGRAPHIC, MEDICAL AND OPTICAL GOODS

BIOCHROME FILMS
COOLED ACTIVE AND PASSIVE LASER MIRRORS
DIAMOND COATED SURGICAL INSTRUMENTS
DIIODIDE OF MERCURY (HgI2) SENSORS
ELECTROANESTHESIA DEVICES
HOMOSORPTION FILTER TECHNOLOGY FOR TREATING POISON
JET INJECTION EQUIPMENT FOR IMMUNIZATION
LIDAR REMOTE SENSING
MEDICAL APPLICATIONS LASERS
MICROSTRUCTURE LASER DEVICES
MONOPULSE TRACKING
PERFORMANCE ENHANCEMENT ELECTRICAL DEVICES
PHYSIOLOGICAL MEASUREMENTS DEVICES
PSEUDORANDOM NOISE CODED WAVEFORM PROCESSING
RESIDUAL STRESS ENGINEERING MEASUREMENT DEVICES
VACCINE INHALATOR DEVICES

(CONTINUED)

SOVIET COMMERCIAL TECHNOLOGIES LIST (CONTINUED)

SIC GROUP 47: TRANSPORTATION SERVICES

SPACE LAUNCH SERVICES
COMMERCIAL EXPERIMENTAL PAYLOAD SERVICES

SIC GROUP 49: ELECTRIC, GAS, AND SANITARY SERVICES

GEOTHERMAL ENERGY PRODUCTION TECHNIQUES

(CONTINUED)

SOVIET COMMERCIAL TECHNOLOGIES LIST (CONTINUED)

SIC GROUP 87: ENGINEERING, ACCOUNTING, RESEARCH, MANAGEMENT, AND RELATED SERVICES

MAGNETOHYDRODYNAMIC-ACCELERATED (MHDA) SIMULATION

TECHNOLOGY DESCRIPTOR – EXAMPLE #1

SIC GROUP 33: PRIMARY METAL INDUSTRIES

TECHNOLOGY: WELDABLE ALUMINUM–LITHIUM (Al–Li) ALLOYS

A. DESCRIPTION

THIS TECHNOLOGY ENCOMPASSES THE DESIGN APPLICATION AND PRODUCTION OF WELDED ALUMINUM–LITHIUM (Al–Li) ALLOY COMPONENTS FOR AEROSPACE VEHICLES. THE SOVIET METHOD INVOLVES THE USE OF POST–WELD HEAT TREATMENT AND OTHER MEASURES, WHICH HAVE NOT BEEN DISCLOSED IN DETAIL, BUT HAVE BEEN OFFERED FOR SALE.

B. TECHNOLOGY ADVANTAGES

THE LOWER DENSITY AND HIGH STRENGTH GAINED BY THE ADDITION OF LITHIUM TO ALUMINUM ALLOYS OFFER SIGNIFICANT SPECIFIC STIFFNESS IMPROVEMENTS AND WEIGHT SAVINGS RANGING FROM 10 – 30% OVER CONVENTIONAL ALUMINUM ALLOYS (DEPENDING UPON DEGREE OF ALLOY INTEGRATION INTO STRUCTURAL DESIGN). A MAJOR FACTOR LIMITING APPLICATION OF WELDED Al–Li CONSTRUCTION IS THE LOSS OF STRENGTH IN THE WELDED ZONE, WHICH CAN REACH LOSSES OF 25 – 30 PERCENT. THE SOVIET METHOD RESULTS IN LOSSES OF 10% IN STRENGTH.

TECHNOLOGY DESCRIPTOR – EXAMPLF #2

SIC GROUP 34: FABRICATED METAL PRODUCTS, EXCEPT MACHINERY AND TRANSPORTATION EQUIPMENT

TECHNOLOGY: ROTARY–PLANETARY MILL MACHINE

A. DESCRIPTION

A ROTARY–PLANETARY MILL (RPS) HAS BEEN CREATED THAT PRODUCES THE FOLLOWING BILLETS: ROUND BILLETS WITH A DIAMETER OF 100–150 mm, SQUARE BILLETS WITH AN 80–120 mm SIDE, AND 70x90– TO 105x140– mm RECTANGULAR BILLETS.

B. TECHNOLOGY ADVANTAGES

THE DESIGN OF THE ROLLING MILL MAKES IT POSSIBLE TO REDUCE ROLL CHANGING TIME TO BETWEEN ONE–FIFTH AND ONE–TENTH OF WHAT IT ORDINARILY IS AND TO INCREASE BEARING LIFE SEVERAL TIMES OVER. ADDITIONALLY, THE RPS HAS 2–3 FOLD HIGHER DRAWING OF THE METAL BEING ROLLED AND A HIGHER QUALITY OF THE METAL AFTER ROLLING.

SECTION III. U.S. ORGANIZATIONS

This section identifies U.S. organizations, -- governmental and corporate -- that are actively engaged in Soviet commercial technology trade:

- U.S. government organizations as reported by the U.S. Department of Commerce, International Trade Administration, USSR Division;

- U.S. corporate organizations based on written responses to U.S. Department of Commerce, Bureau of Export Administration, Office of Foreign Availability solicitation published in the Commerce Business Daily on 22 March 1990.

U.S. GOVERNMENT ORGANIZATIONS

U.S. DEPARTMENT OF COMMERCE

Joint Commercial Commission

The Joint U.S.-U.S.S.R. Commercial Commission (JCC) was established at the Moscow Summit in May 1972 to negotiate commercial agreements and to oversee their implementation. The Commission, which normally convenes at least once a year, is the mechanism for commercial dialogue between the two countries at both the policy and staff levels; it is also a forum for problem-solving and discussion of operational matters.

The JCC attempts to meet every year alternatively between Moscow and Washington, D.C. The 1989 JCC, held in Washington, was co-chaired by U.S. Secretary of Commerce Mosbacher and Soviet Minister of Foreign Economic Relations Katushev. The JCC agreed upon several new policy initiatives as well as trade promotion programs. Among other activities, the co-chairman agreed that American and Soviet officials would begin negotiations on a new bilateral tax treaty. New trade initiatives include encouraged cooperation in the consumer sector; exchanges between Soviet co-operatives and American companies; exchanges between American states and Soviet regions; and the creation of a working group to generate business in the tourism industry.

U.S.S.R. Division, International Trade Administration

This office provides policy guidance; current information and analysis on economic developments, foreign trade policy and commercial practices in the U.S.S.R.; help with Soviet foreign trade contacts; and information on Commerce sponsored trade promotion activities in the Soviet Union. Its staff keeps abreast of relevant developments, and is responsible for substantive and secretariat support for the JCC, as well as assistance in trade promotions. The division also maintains close contact with Commerce's Commercial Office in Moscow and with Soviet commercial offices in the United States.

Room 3413
Herbert Hoover Building
U.S. Department of Commerce
Washington, D.C. 20230.
(202) 377-4655

U.S. Commercial Office (USCO)

The U.S. Department of Commerce operates a commercial office in Moscow. Business representatives traveling to Moscow are encouraged to consult with the Senior Commercial Officer (SCO) for policy guidance, trade policy briefings, and assistance in business facilitation such as arranging meetings, temporary office space, audiovisual and translation equipment.

USCO also has a commercial library, telex, fax, and photocopying equipment, and is open weekdays from 9 a.m. to 6 p.m. Mail can be addressed to:

U.S. Commercial Office
The American Embassy
APO New York 09862
TX: 413205 USCO SU

U.S. Commercial Office
Ulitsa Chaikovskogo 15
Moscow, USSR
Tel: 255-48-48
Fax: 230-2101

Bureau of Export Administration (BXA)

Before beginning negotiations on exports to the Soviet Union, firms should consult BXA in order to clarify applicable export control policies and regulations. The Department of Commerce administers export controls for national security, foreign policy, or short supply reasons. The Commodity Control List (part 799.1 of the Export Administration Regulations) states which commodities require a validated license for export to the Soviet Union. A validated export license is a document issued by BXA authorizing a specific item for a specific end use in a specific country. If no license is required, the exporter simply indicates on the shippers export declaration that the items are exportable under General License "G-DEST".

Specific questions or requests for assistance should be addressed to:

Exporter Service Staff
Bureau of Export Administration
U.S. Department of Commerce
Washington, D.C. 20230
202-377-4811.

U.S. firms contemplating joint ventures with the Soviet Union can receive counseling from BXA. Early counseling regarding export licensing for U.S.-Soviet joint venture proposals and related technology transfers is advisable. Interested parties should contact Mr. Sandy Dhier, Director of the Capital Branch and Technology Branch of BXA, at 202-377-5695.

Office of Import Investigations

For firms interested in purchasing Soviet-origin goods, the Office of Import Investigations can identify restrictions on imports from the U.S.S.R. and has available up-to-date information on the status of dumping and countervailing duty investigations. ITA is responsible for determining whether foreign merchandise is being sold in the United States at less than fair value according to the Tariff Act of

1930. The International Trade Commission is responsible for determining whether these sales injure U.S. industry. In the event that both investigations show that a foreign country or firm is indeed dumping products in the U.S. market, an importer is required to deposit estimated dumping duties on all merchandise subject to affirmative action.

Room 3047
Herbert Hoover Building
U.S. Department of Commerce
Washington, D.C. 20233
202-377-5497

Firms interested in importing from the U.S.S.R. can contact the Government Printing Office at 202-783-3238 to purchase the Tariff Schedule of the United States, Annotated, (TSUSA) 1987, USITC #1910, for information on U.S. tariff rates for foreign goods. Many large libraries will have the TSUSA schedules as well. Since the United States does not extend Most-Favored-Nation status to the Soviet Union, look under Column 2 for imports to determine the tariff rate.

U.S. Department of Agriculture (USDA)

The Foreign Agricultural Service is prepared to assist businesspeople in two areas. At the U.S. Embassy in Moscow, the Agricultural Office assists in trade opportunities, current market analyses, and crop reports. In Washington, D.C. the following areas within the FAS will accept calls regarding trade opportunities for specific commodities.

Grains and Feed Division	202-477-6219
Dairy, Livestock and Poultry Div.	202-477-8031
Oilseeds and Products Div.	202-447-7037
Tobacco, Cotton, and Seeds Div.	202-382-9516
Horticulture & Tropical Plants Div.	202-447-6590

Information regarding U.S. Government Trade Policy and the Export Enhancement Program (EEP) may contact:

The Office of Trade Policy
Africa, Asia and the Middle East Division
Foreign Agricultural Service
USDA
202-382-1289

The EEP is the sole current agricultural trade program with the U.S.S.R.

Office of the Agricultural Center
American Embassy Moscow
APO New York 09862
Tel.: 252-2451

U.S. Department of State (State)

Two offices at the Department of State are involved in the formulation and implementation of U.S. economic policies vis-a-vis the Soviet Union:

Economic Section
Office of the Soviet Union Affairs
Bureau of European Affairs
U.S. Department of State
Washington, D.C. 20520
202-647-9370

Office of East-West Trade
Bureau of Economic Affairs
U.S. Department of State
Washington, D.C. 20520
202-647-2875

The Embassy in Moscow can also assist business travelers with travel-related problems in the Soviet Union, with questions relating to official contacts with Soviet Union authorities, and with informational briefings for group travellers.

Office of Economic Affairs
American Embassy Moscow
APO New York, N.Y. 09862
Tel.: 252-2451

U.S. CORPORATE ORGANIZATIONS

COMPANY NAME	ADDRESS	BUSINESS	JOINT VENTURE	SOVIET ORGANIZATION
Arthur D. Little	Acorn Park Cambridge, MA 02140-2390 (617)864-5770/(617)661-1622 :FAX Theodore Heuchling, Senior Vice President	R&D Commercial Partnership	E'West	The Academy of Sciences
Columbia Policy Institute, Inc.	Box 26812 Baltimore, MD 21212 (301)323-7034 Gary Green	Musical recordings Literature Non-fiction writings		Melodia Progress Publishers Novosti
Consolidated Ventures International, Inc	220 E. Huron, Suite 400 Ann Arbor, MI 48104 (313) 662-4210 (313) 994-9304 :FAX H. Joseph Pratt, President	Trading and Investment Company — Agribusiness — Electronics — PC Computers and Software — Heavy Machinery		
Davis and James, Inc.	Suite 301 555 N. New Ballas St. Louis, MO 63141 (314)997-2779 John W. Robbins, Director, Operations	Personnel Recruiting — Programming — Personal Computers — Design Engineeirng — Manufacturing — Construction Technology		
Delphic Associates	#250 7700 Leesburg Pike Falls Church, VA 22043 (703)556-0278/(703)556-0494 :FAX Gerold Guensberg	Research & Consulting Services — Miniature Sleeve Bearings — S&T Developments		GPZ NII CHASPROM VNIIP
Engineering and Economics Research, Inc. (EER Systems)	1593 Spring Hill Road Vienna, VA 22182 (703)847-5750 Michael W. Bryant, Director of Corporate Communications	Technology Assessments — Cognitive Skills Diagnosis — Bionics — Robotics — Advanced Materials — Artificial Intelligence		Soviet Academy of Sciences

(Continued)

U.S. CORPORATE ORGANIZATIONS

COMPANY NAME	ADDRESS	BUSINESS	JOINT VENTURE	SOVIET ORGANIZATION
FYI Information Resources	735 8th Street S.E. Washington, DC 20003 (202)544-2394 Lynn Wildman, Assistant to the President	Research & Consulting Services — Business — Political — Environmental		
General Physics Corp.	6700 Alexander Bell Drive Columbia, MD 21046 (301)290-2749 Ashok Arora, Vice President, Operations	Nuclear Science and Technology — Hardware & Software Power Plant Technology Petrochemical Processes		KURCHATOV Institute VNIIAES Institute MINCHEMPROM SPETSATOM ATOMENERGOEXPORT
Global Development Corp.	Suite 110 5201 Great American Parkway Santa Clara, CA 95054 (408)562-6230 Mark Muchnick	Hi-Tech Electronics		
HiTc Superconco, Inc.	140 Bordentown Road Tullytown, PA 19007 (215)943-9023/(215)397-2010/(609)397-2708 :FAX Richard B. Cass, President	Self-Propogating Synthesis Procedures (SHS) for the production of powders Ceramics Composites High Temperature Superconductors Advanced Materials		Interdisciplinear Science & Technology Complex (Dr. Merzhanov)
Hogan & Hartson	Columbia Square 555 13th Street, N.W. Washington, DC 20004-1109 (202)637-5600/(703)847-6002/(202)637-5910 :FAX Raymond E. Vickery, Jr.	Aviation Computer Software Energy Medical Devices Space Tech and Telecommunications		
Hudson Street International	Suite 7E 90 Hudson Street New York, NY 10013 (212)966-7540/(212)966-7562 :FAX Norman H. Gershman, Chairman	Medical Environmental Biological	MEBINVEST	State Committee for Inventions, All Union Center of Patent Services

(Continued)

U.S. CORPORATE ORGANIZATIONS

COMPANY NAME	ADDRESS	BUSINESS	JOINT VENTURE	SOVIET ORGANIZATION
Institute for Advanced Studies	Suite A-232 1301 Capitol of Texas Highway South Austin, TX 78746 (512)328-5751/(512)328-9852 :FAX Dr. H.E. Puthoff	Ultrasonics Defects in Metals Remote Monitoring Static Electricity Protection		USSR Ecological Union
Kiser Research, Inc.	Suite 505 1233 20th Street, N.W. Washington, DC 20036 (202)233-5806/(202)452-9571 :FAX J. Kiser, B. O'Meara, G. Farnbach, J. Ziker	Self-Propagating High-Tempature Synthesis (SHS) Initiated Pyrolasis Turbulent Microreactor Componor Tacitrons		
Laventhol & Horwath	11th Floor 1845 Walnut Street Philadelphia, PA 19103 (215)299-1460 Alice Epstein, Principal	Health Care Technology		The Soviet Ministry of Health All Union Scientific Research Institute for Medical Engineering
Northern Research and Engineering Corp.	39 Olympia Avenue Woburn, MA 01801 (617)935-9050/(617)935-9052 :FAX Mr. Kymus Ginwala, President	Fluid Machinery Gas and Steam Turbines Compressors and Pumps		
Oxford Marketing Group	33 Kensington Road Kensington, CT 06037 (203)828-1635/(203)828-6927 :FAX Scott DeFelice, Director	Trading & Marketing — Aluminum products - export — Injection molding of thermoplastics - export — Seismic instrumentation - import		Diapazon Cooperative
Payload Systems, Inc.	276 Third Street Cambridge, MA 02142 (617)868-8086/(617)868-6682 :FAX Mr. Vinit Nijhawan, Senior VP & COO Dr. Anthony Arrott, President	Space Flight Experimentation Technology Launch Services Instrumentation		
PHD Technologies, Inc	6382 Morrowfield Ave Pittsburgh, PA 15217 (412)521-0405 Harvy B. Meieran, Vice-President	Soviet Advanced Technology		

(Continued)

U.S. CORPORATE ORGANIZATIONS

COMPANY NAME	ADDRESS	BUSINESS	JOINT VENTURE	SOVIET ORGANIZATION
Presearch, Inc.	8500 Executive Park Avenue Fairfax, Virginia 22031 (703) 876-6400 Mr. Andrew B. Goreff	Soviet scientific and technical analytical capability		
The Space Commerce Corp.	6900 Texas Commerce Tower Houston, Texas 77002 (713)227-9008/(713)227-9006 :FAX Arthur M. Dula, President	Launch Services & Vehicles Communication Satellites & Services Remote Sensing		Glavkosmos
Space Studies Institute	P.O. Box 82 Princeton, NJ 08553 (609)921-0377/(609)921-0389 :FAX Chris Farentina Soviet Activities Liaison	Aeorspace composites Alloys Optics Booster systems Material analysis computers		
Steg, Ray and Associates	1616 Hepburn Drive Villanova, PA 19085 (215)520-0888/(215)520-0810 :FAX Leo Steg	Technology Consulting — Microgravity Research and Space Processing — Software - data processing — *Composite Materials* — Educational Technology		Soviet Academy of Sciences Intercosmos Ministry of Energy Ministry of Higher Education
Technology Applications International, Inc.	9302 Lee Highway, Suite 1200 *Fairfax*, VA 22031-1207 Dr. Yan Yufik, Principal	Artificial Intelligence *Cognitive Engineering*		
The Technology Associates Corporation (TTAC)	22 Upper Commons, Woodlake Woodbury, CT 06798 (203)263-2194 Norman Geril, President	Optical Designs Optical Fabrication Methods		

SECTION IV. USSR ORGANIZATIONS

The following section lists Soviet organizations that market technologies and products to the West. It is comprised primarily of foreign trade associations and regional trade associations. The USSR government also recently granted a large number of state research institutes and enterprises the right to deal directly with foreigners. This list is in no way exhaustive.

SOVIET FOREIGN TRADE ORGANIZATIONS

ORGANIZATION	ADDRESS	BUSINESS
Agroprom Service	Moscow 103030 Per. Chernishevskovo 4, Bldg 1 281-2201 Telex: 411624	Association of business cooperation with foreign countries in agricultural production
Krylov Shipbuilding Research Institute	196158 Leningrad 127-93-49 Telex: 121467 CENKR SU	Maritime research
SPA Carat	290031 Lvov Ul. Stryjska 202 Telex: 234161 CARAT SU	Export of dielectric pastes and crystal wafers
V/O Almazyuvelir-export	Zubovsky Bld 25, Kor. 1 245-0259, 245-3410 Telex: 411125 ALMAZ SU	Export diamonds, jewelry & precious stones & metals
V/O Armenintorg	375086 Erevan Ul. Shiraki 43 46-7172	Armenian export & import organization
V/O Atomenergo-export	Ovchinnikovskaya Nab. 18/1 220-1436, 231-8014 Telex: 411397 AEE SU	Export & import of nuclear power plants & equipment
V/O Aviaexport	Ivan Franko St., 48 Moscow 121351 Tel. 417-00-55 Telex: 4199929A	Aviation Industry

(Continued)

SOVIET FOREIGN TRADE ORGANIZATIONS

ORGANIZATION	ADDRESS	BUSINESS
V/O Avtoexport	Ul. Marxa-Engelsa 8 202-6221 Telex: 411135 AVTEX SU	Export & import of motor vehicles & agricultural machinery
V/O Avtopromimport	Ul. Pyatnitskaya 50/2 23-8126 Telex: 411961 API SU	Import of automotive equipment
V/O Azerbintorg	370016 Baku Ul. Nekrasova 7 92-2940 Telex: 142127	Azerbaijan export & import organization
V/O Belorusintorg	220010 Minsk Dom Pravitelstva 20-8188	Belorussian export & import organization
V/O Dalintorg	Nakhodka (Primorsky Krai) Nakhodkinsky Pr. 16a 4-4877 Telex: 213814 DIT SU	East Siberian & Far Eastern trade with Japan, Australia, China & N Korea
V/O Elektronintorg	Ul. Usievicha 24/2 155-4915 Telex: 411326 EZP SU	Export of electronic equipment

(Continued)

SOVIET FOREIGN TRADE ORGANIZATIONS

ORGANIZATION	ADDRESS	BUSINESS
V/O Elektronorgtekhnika	Ul. Gertsena 24 205-0033, 205-3878 Telex: 411386 EOT SU	Exports & imports computer equipment & electronic components
V/O Ellers	Ussievich St., 24/2 Moscow 125315 Tel. 155-40-33,155-40-38,155-49-15 Telex: 411326 Fax: 151-54-41	Electronics
V/O Energomashexport	Ul. Gertsena 24 203-1571 Telex: 411965 ENEK SU	Export of heavy, power & transport machinery)
V/O Estimpex	200001 Tallinn Ul. Tolli 3 60-1462 Telex: 173896 ANTIK	Estonian export & import organization
V/O Expocentr	Sokolnichesky Val 1a 268-7083, 268-6352 Telex: 411185 EXPO SU	Arranges foreign exhibitions & symposia & assists exhibitors
V/O Exportkhleb	Smolenskaya-Sennaya 34/32 244-4701, 244-1247 Telex: 411145, EHLEB SU	Export & import of grain products

(Continued)

SOVIET FOREIGN TRADE ORGANIZATIONS

ORGANIZATION	ADDRESS	BUSINESS
V/O Exportles	Trubnikovsky Per. 19 291-5815, 291-2666 Telex: 411229 EXLES SU	Export & import of lumber products
V/O Exportljon	Ul. Arkhitektora Vlasova 33 128-0786 Telex: 411204 ELJON SU	Export & import of cotton, flax wool, silk & related products
V/O Gruzimpex	397090 Tbilisi Pr. Rustabeli 8	Georgian export & import organization
V/O Interlatvia	226001 Riga Ul. Lenina 85 27-1662	Latvian export & import organization
V/O Kazakhintorg	480003 Alma-Ata Ul. Gogolya 111 32-3600	Kazakh export & import organization
V/O Khimmashexport	Ul. Mosfilmovskaya 35 143-8663 Telex: 411068 TEHEX SU; Telex: 411228 TECEX SU	Export & import of equipment chemical & oil industry
V/O Kirgizintorg	720000 Frunze Ul. Kirova 205 26-6366	Kirgiz export & import organization

(Continued)

SOVIET FOREIGN TRADE ORGANIZATIONS

ORGANIZATION	ADDRESS	BUSINESS
V/O Legpromexport	Pr. Kalinina 29, Kor. 4 291-9496 Telex: 411859	Export & import of raw & semi-finished furs & textiles
V/O Lenfinforg	Leningrad, Moskovsky Pr. 98 292-5633 Telex: 121518	Leningrad area & Baltic republics' trade with Scandinavia
V/O Litimpex	232600 Vilnius Pr. Lenina 37 62-1453 Telex: 278128 LIET	Lithuanian export & import organization
V/O Litsenzintorg	Ul. Minskaya II 145-2700, 145-1111 Telex: 411415, LIT SU	Export & import of patents
V/O Mashinoexport	Ul. Mosfilmovskaya 35 143-8927, 147-1542 Telex: 411207 MCHEX SU	Export of heavy machinery
V/O Mashinoimport	Smolenskaya-Sennaya 32/34 244-3309, 244-1538, 437-5163 Telex: 411231 MIM SU	Import of power, oilrefining & mining equipment, railway rolling stock & industrial fittings

(Continued)

SOVIET FOREIGN TRADE ORGANIZATIONS

ORGANIZATION	ADDRESS	BUSINESS
V/O Mashprilborintorg	2-Spasonalivkovskiy, 6 Moscow GSP-1, 117909 Tel.: 238-82-31 Telex: 411235, 411236 Telefax: 238-22-65	Communications
V/O Mebelintorg	Ul. Bolshaya Filevskaya 35 146-3672 Telex: 411282 DERBI SU	Export & import of furniture, wooden building components
V/O Medexport	Ul. Kakhovka 31, Kor.2 331-8200 Telex: 411247 MEDEX SU	Export & import of medical & pharmaceutical goods
V/O Metallurgimport	Ul. Arkhitektora Vlasova 33 128-0932 Telex: 411388 MGI SU	Imports machinery for the extrcation industries, especially ferrous metals
V/O Mezhdunarodnaya Kniga	Ul. Dimitrova 39 238-4600 Telex: 411160 MKN SU	Export & import of books, periodicals & sheet music

(Continued)

SOVIET FOREIGN TRADE ORGANIZATIONS

ORGANIZATION	ADDRESS	BUSINESS
V/O Moldex	277018 Kishinyov Ul. Botanicheskaya 15 55-7036/38 Telex: 163125 KODRU SU	Moldavian export & import organization
Moscow Representative	Ul. Zhdanova 7 9287-6119 Fax 928-9037	
V/O Morsvyazsputnik	Ul. Zhdanova 1/4 258-7045 Telex: 411197 MMF SU	Coordinator of satellite means of maritime communication
V/O Mortekhinformreklama	158-2553 Telex: 411197	Science & technology information & advertising
V/O Neftechimpromexport	Ovchinnikovskaya Nab. 18/1 220-1109 Telex: 411113 NCPEX SU	Aid in designing petrochemical & chemical plants & pulp-and-paper factories
V/O Novoexport	Ul. Chekhova 2 299-0006 Telex: 411254 NOVEX SU	Export of carpets, jewelry, sculpture, handicrafts & antiques
V/O Obshehemashexport	Krasnoproletarskaya St., 9 Moscow 101444, CSP-4 Telex: 411836 CZM SU	General Machine Building

(Continued)

SOVIET FOREIGN TRADE ORGANIZATIONS

ORGANIZATION	ADDRESS	BUSINESS
V/O Prodintorg	Smolenskaya-Sennaya 32/34 244-2629 Telex: 411206 PRDIT SU	Export & import of food products of animal origin & also sugar & vegetable oils
V/O Prommashimport	Ovchinnikovskaya Nab. 18/1 220-1351 Telex: 411260 PMI SU	Export & import of pulping & paper-making machinery
V/O Promsyrioimport	Ul. Chaikovskovo 13 203-0577, 203-0646, 203-0595 Telex: 411151 PSIM SU	Export & import of pig iron & ferro alloys, steel wire, metal products
V/O Radioexport	35, Kirov St. Mosccow 101959 Tel.: 923-79,49, 243-53-57 Telex: 411376, 411386 RADE SU	Radio Industry
V/O Raznoexport	Ul. Verkhnaya Krasnoselskaya 15 264-5656, 264-0183 Telex: 411408 RZEK SU	Export & import of light industrial & consumer goods
V/O Raznoimport	Ovchinnikovskaya Nab. 18/1 233-2279 Telex: 411118 RZIM SU	Export & import of non-ferrous metals, rubber & cork products

(Continued)

SOVIET FOREIGN TRADE ORGANIZATIONS

ORGANIZATION	ADDRESS	BUSINESS
V/O Rosvneshtorg	Ul. Barrikadnaya 8/5 255-1342 Telex: 411060 ROSST SU	RSFSR export & import organization
V/O Selkhozpromoexport	Ovchinnikovskaya Nab. 18/1 220-1692 Telex: 411933 SHPEX SU	Aid in construction of storage, irrigation facilities & c.
V/O Skotoimport	Ul. Makarenko 6 921-6479	Import of slaughter meat cattle, sheep, goats, swine, meat horses, also meat of domestic & wild animals
V/O Sovbunker	Ul. Novoslobodskaya 14/19, Kor.7 258-9122 Telex: 411134 Fax 288-9569	Bunkering, export-import operations repairing ships abroad
V/O Sovelectro	Ul. Deguninskaya 1, Kor.4 487-3181, 487-3132 Telex: 411003 SOEL SU	Export of power machinery
V/O Sovexbrikniga	125047 Moscow, Ul. Gorkono 50 251-7276, 251-1931 Telex:: 411069 SUPOR SU	Exports books
V/O Sovexportfilm	Katashny Per.14 290-5009 Telex: 411143 SEF SU	Export & import of films

(Continued)

SOVIET FOREIGN TRADE ORGANIZATIONS

ORGANIZATION	ADDRESS	BUSINESS
V/O Sovfrakht	Ul. Zhdanova 1/4 926-1118 Telex: 4111168 SFHT SU	Soviet chartering organization
V/O Sovincentre	Krasnopresnenskaya, Nab 12 255-6401, 256-6303 Telex: 411486 SOVIN SU	Provides commercial services to promote interntional commercial & scientific-technical relations
V/O Sovinfilm	Skatertny Per.20 290-1000 Telex: 411114 INFLM SU	Handles international film production projects, rents equipment etc.
V/O Sovinteravtoservice	Institutsky Per. 2/1 299-7773/299-5900 Telex: 411008	Provides services on credit & for cas to foreign owners of cars, lorries & buses in the Soviet Union
Protocol Department	971-0337 Telefax (7-095) 230-2450	
Moscow-Helsinki two-way courier service	299-7773, 299-5900	
V/O Sovintersport	B. Rzhevsky Per.5 291-9149 Telex: 411578 PIK SU	Sports equipment & sport events contracts
V/O Sovkomflt	Ul. Zhdanova 1/4 926-1301 Telex: 411168	Export of ships for scrap

(Continued)

SOVIET FOREIGN TRADE ORGANIZATIONS

ORGANIZATION	ADDRESS	BUSINESS
V/O Sovrybflot	Rozhdestvensky Bld. 9 208-4057 Telex: 411208	Leases, services & supplies fishing vessels, supplies fish products
V/O Sovtransavtoexpeditsia	Ul. B. Ochakovskaya 15a 430-7867 Telex: 411927 STE SU	International freight forwarding
V/O Sovtransvto	Institutsky Per. 2/1 971-3663 Telex: 411251 STA SU	Transports foreign exhibition goods runs international bus & truck service
V/O Soyuzkarta	Volgogradsky Pr. 45 177-4050 Telex: 411942 REN SU	Geodesics, cartography & space photos
V/O Soyuzkhimexport	Smolenskaya-Sennaya 32/34 244-2284 Telex: 411297 KHIM SU	Export & import of chemical products
V/O Soyuzkoopvneshtorg	B. Cherkassky Per. 15 927-0980 Telex: 411127 SKVT SU	Export & import trade with foreign & cooperative firms and societies
V/O Soyuzmedexpote	Smdeuskays-Serrya 32/34 244-3285	

(Continued)

SOVIET FOREIGN TRADE ORGANIZATIONS

ORGANIZATION	ADDRESS	BUSINESS
V/O Soyuznefteexport	Smolenskaya-Sennaya 32/34 244-4048, 244-4049 Telex 411148 NAFTA SU	Export & import of petroleum products, gas & gas products
V/O Soyuzpatent	Ul. Kuibysheva 5/2 925-1661, 925-6800 Telex: 411431 ATPP SU	Patents, registration of trademarks
V/O Soyuzplodoimport	Smolenskaya-Sennaya 32/34 244-2258 Telex: 411262 SPI SU	Export & import of foodstuffs & agricultural products of vegetable origin
V/O Soyuzpromexport	Smolenskaya-Sennaya 32/34 244-1979, 244-4768 Telex: 411268 SPE SU	Export & import of ferrous metals, coals, mineral ores
V/O Soyuzpromimporttorg	Pr. Vernadskovo 25 131-5128 Telex: 411245 ARTUS SU	Export-import with socialist countries
V/O Soyuzveshtrans	Gogolevsky Bld. 17 203-1179, 203-2227 te;ex 411441 SVT SU	Transport of exports & imports & shipments of transit goods through the USSR
V/O Soyuzvneshstrojimport	Tverskoi Bld. 6 290-0684 Telex: 411434 SVSI SU	Joint venture construction

(Continued)

SOVIET FOREIGN TRADE ORGANIZATIONS

ORGANIZATION	ADDRESS	BUSINESS
V/O Soyuzzagranpribor	Ul. Ogareva 5 229-6110 Telex: 411437 GRAND SU	Supplies automatic control systems & computorized control centres
V/O Stankoimport	Ul. Obrucheva 34/63 333-5101, 334-7600 Telex: 411991 STIM SU	Export & import of machine tools & precision instruments
V/O Stroidormashexport	Suvorovsky Bld. 7 291-4931 Telex: 411063 BREIM SU	Export & import of road-building machines
V/O Stroimaterialintorg	Ul. Kievskaya 19 Telex: 411887 STR SU	Export & import of building materials - abestos, glass, plastics, etc.
V/O Sudoimport	Uspensky Per. 10 299-6849 Telex: 411383 SUDO SU	Export, import & repair of ships
V/O Tadjikvneshtorg	734051 Dushanbe Pr. Lenina 42 Telex: 116119 SAWDO	Tadjik export & import organization
Moscow Representative	Ul. Stanislavskovo 18 229-2285	

(Continued)

SOVIET FOREIGN TRADE ORGANIZATIONS

ORGANIZATION	ADDRESS	BUSINESS
V/O Tekhmashexport	Center Moscow 101850 Tel.: 206-91-58 Telex: 411068 TEHEX SU	Defense Industry
V/O Tekhnoexport	Ovchinnikovskaya Nab. 18/1 220-1782 Telex: 411338 VOTE SU	Aid in prospecting & construction in light & medical industries
V/O Tekhnointorg	Ul. Pyatnitskaya 64 233-0032 Telex: 411200 TENT SU	Export & import of television, radio cine & photo equipment, time measuring instruments & electrical household appliances
V/O Tekhnopromexport	Ovchinnikovskaya Nab. 18/1 220-1523 Telex: 411158 TPEES SU	Aid in construction of power stations & power lines
V/O Tekhnopromexport	Ul. Mosfilmovskaya 35 147-2177, 147-2285 Telex: 411233 TRI SU	Import of equipment for industry
V/O Tekhsnabexport	Moscow Straromonetny Per. 26 Moscow 109180 Tel.: 233-48-46 Telex: 411328 TSE SU Fax: 095-233-1859	Atomic Energy and Industry

(Continued)

SOVIET FOREIGN TRADE ORGANIZATIONS

ORGANIZATION	ADDRESS	BUSINESS
V/O Tekmashimport	Trubnikovsky Per. 19 202-4800 Telex: 411194 TIM SU	Imports refrigeration equipment & goods for chemical & textile plants
V/O Traktoroexport	Ul. Lesnaya 41 258-5934 Telex: 411273 TREVP SU	Export, import & servicing of farm & road-building machinery
V/O Tyazhostok	Ul. B Serpukhovskaya 26 236-5072 Telex: 411207	Metallurgical & mining equipment; rolling stock
V/O Tyazhpromexport	Ovchinnikovskaya Nab. 18/1 220-1610 Telex: 411931	Aid in heavy industrial development
V/O Ukrimpex	252054 Kiev Ul. Vorovskovo 22 216-2124 Telex: 131384	Ukrainian export & import organization
Moscow Representative	Ul. Stanislavskovo 18 229-2285	
V/O Uzbekintorg	70115 Tashkent Uzbekistansky Pr. 45 45-7313	Uzbek export & import organization

(Continued)

SOVIET FOREIGN TRADE ORGANIZATIONS

ORGANIZATION	ADDRESS	BUSINESS
V/O Vneshpromtekhobmen	Per. Vasnetsova 9 284-7241 Telex: 411181	Export & import of technical production with socialist & developing countries; export of secondary raw production
V/O Vneshtekhnika	Starokonyushenny Per. 6 201-7260 Telex: 411418 MLT SU	Scientific & technical exchange with foreign countries
V/O Vneshtorgeklama	Ul. Kakhovka 31, Kor. 2 331-8311 Telex: 411265 VTR SU	Foreign trade advertising organization
V/O Zapchastexport	2-Skotoprogonnaya Ul. 35 278-6305 Telex: 411243 ZCHEX SU	Export of spare parts for Soviet machinery sold abroad
V/O Zarubezhgeologiya	Kaloshin Per. 10 241-1515 Telex: 411829 GZGEO SU	Geological equipment & research abroad

(Continued)

SECTION V. JOINT VENTURE PROGRAMS

This section identifies U.S. - USSR joint venture programs registered with the USSR Ministry of Finance from December 1987 to December 1988 as published by the Foreign Broadcast Information Service in JPRS Report: Soviet Union, International Affairs, List of Joint Ventures Registered with the USSR Ministry of Finance, (JPRS-UIA-89-007), 13 April 1989.

U.S – U.S.S.R. JOINT VENTURES

JOINT VENTURE	JOINT VENTURE/ NAME & ADDRESS	UNITED STATES PARTNER(S)	SOVIET ORGANIZATION(S)	SPHERE OF ACTIVITY	ASSETS
Dialog	Dialog, 107066, Moscow, ul. Spartakovskaya, 13	Management Partnerships International, Inc., USA (21.8%)	PO KamAZ (32.6%), MGU [Moscow State University] (13%), IKI [Space Research Institute] (7.2%), TsEMI [Central Economics and Mathematics Institute] (13.0%), GDIVTs VDNKh SSSR (2.6%), V/O Vneshetkhnika (9.8%), (overall share 78.2%)	Production of software; assembly of personal computers; sale of products; production, processing, and sale of other products; rendering services	15.35 million rubles
Dresser Soviet Engineering	Dresser Soviet Engineering, Moscow	Dresser Industries, Inc., USA (40%)	NPO Kazankompressormash, NPO Bolshevik, Stankoimport, V/O Soyuskhimeksport (Overall share 60%)	Organizing and coordinating activies of Soviet and foreign organizations participating in joint creation of production capacities in the USSR and other countries; providing associated engeering services.	.375 million rubles
Inform-pravo	Inform-pravo, Moscow, ul. Druzhby, 10	Robert A. Weaver, USA; Yakko, Leyto, Finland; Simeno Finance S.A., Italy (overall share 49%)	Moscow City Bar (26%) Union of Scientific and Engineering Societies (25%)	Providing assistance to foreign firms and Soviet organizations including transactions, creating joint ventures, compiling legal documents, consultations, marketing and advertising	0.125 million rubles

(Continued)

U.S – U.S.S.R. JOINT VENTURES

JOINT VENTURE	JOINT VENTURE/ NAME & ADDRESS	UNITED STATES PARTNER(S)	SOVIET ORGANIZATION(S)	SPHERE OF ACTIVITY	ASSETS
Intermedbio-IM	Intermedbio-IMB, 123242, Moscow, ul. Konyushkovskay 31	Interconcepts Inc., USA (49%)	Leningrad Oktyabr Chemical and Pharmmaceutical Production Association (21%) UNIVERservis Cooperative (30%)	Marketing, advertising and exporting of industrial, agricultural, scientific and other goods and services, industrial by-products and secondary resources; importing, designing and leasing of personal microcomputers; development and sale of software	4.0 million rubles
Interskrap	Interskrap, Moscow	American General Resources Inc., USA (49%)	Primorskoye Fish Industry Production Association (PO), PO Estremrybflot, PO Murmansk Shipyards, V/O Sovrybflot (51%)	Stripping, dismantling and cutting any ships and other materials into scrap metal, obtaining associated products, and selling them (including engins, equipment, scrap metal)	0.063 million rubles
Khaytek	Khaytek, Groznyy	Foster Wheeler intercont-inental, USA (45%)	NPO Groznefteknim (55%), Ministry of the Petroleum Refining and Petrochemical Industry	Providing planning and design services, supplying and managing activities of facilities of the petroleum and petrochemical industry in the USSR and abroad.	0.7 million rubles

(Continued)

U.S – U.S.S.R. JOINT VENTURES

JOINT VENTURE	JOINT VENTURE/ NAME & ADDRESS	UNITED STATES PARTNER(S)	SOVIET ORGANIZATION(S)	SPHERE OF ACTIVITY	ASSETS
Perestroyka	Perestroyka, Moscow	Delphi International USA (20%)	Main Adminstration for Engineering Construction (60%), Administration of High-Rise Buildings and Hotels (8%), Main Administration of Architecture and City Designing and Building (5%), Dialog Joint Venture (7%)	Construction and renovation of buildings and facilities; providing services	7.5 million rubles
PRIS	PRIS, Moscow	Combustion Engineering Inc., USA (49%)	Neftekhimavtomatika NPO (51%)	Development, design, production, and commissioning of automated control systems for production processes in oil refining, petrochemical andd chemical industries	5.15 million rubles and $ 8 million
Sovaminko	Sovaminko, 129820, Moscow, 10y Rizhskiy per., 2	Unicorn Seminars, Inc., USA (49%)	Izdatelstvo "Mir" (21%) Rekord Association (20%) Sintez Cooperative (10%)	Publishing and printing production; development and sale of printed and audiovisual products and consumer goods; providing publishing intermediary and consulting services; holding exhibits and other	2.0 million rubles
Sovelan Aroma	Sovelan Aroma, Moscow	Elan International, USA (20%)	All-Union Scientific Research Institue of Fisheries and Oceangraphy (80%)	Production of flavoring and aromatic additives	0.5 million rubles

(Continued)

U.S – U.S.S.R. JOINT VENTURES

JOINT VENTURE	JOINT VENTURE/ NAME & ADDRESS	UNITED STATES PARTNER(S)	SOVIET ORGANIZATION(S)	SPHERE OF ACTIVITY	ASSETS
SovinterInvest	SovinterInvest Moscow	USCO Investment Enterprise, USA (12.35)	PO Primorrybprom, Academy of Sciences IMEMO PO Foton of the USSR MPSS PO Azot of the USSR Ministry of Mineral Fertilizer Production, PO Orbita-Servis of the MPS VZIPP USSR State Committee for Education, Agrofirma Tsentralnoye, RPO Rosagropriminform of the All-Union Academy of Agricultural Sciences imeni V.I. Lenin, Uzbektekstilmash Association of the USSR Ministry of Building, ISDF of the USSR State Committe for Cinematograpy All-Union Youth Housing Complex Center (Total share 87.7%)	Jt. organization and particiation in jt. venture activities to produce competitive products; providing services associated with introducing adv. technologies; assisinting in retooling and equipping of enterprises in the USSR	4.06 million rubles
STERKh-AV-tomatizatsiya	STERKh-AV-tomatizatsiya Moscow	Honeywell, Inc., USA; Honeywell Austria GmBH Austria (49%)	Orgminudobreniya Trust (31%), Mineral Experimental Design Bureau (20%)	Design of control systems, engineering, development of software to increase production efficiency	0.95 million rubles

SECTION VI. SOVIET COMMERCIAL TECHNOLOGIES

The Interagency Technology Group (ITAG) recently received a number of responses to its announcement in the Commerce Business Daily for information of commercial technologies estimated to lead Western accomplishments. The ITAG also collected information from press accounts, on-line data services and international trade fairs. Although the collected information varied considerably in the amount of detail, we have listed here those items estimated to be of commercial interest. Technology descriptions are those available from the sources mentioned above, and technology advantages are those suggested by the source of the information.

Persons interested in more detailed information should address themselves to one of the relevant U.S. or Soviet organizations listed in Parts III. or IV. of this report.

SOVIET COMMERCIAL TECHNOLOGIES

SIC GROUP 12: COAL MINING

BREAKAGE-FACE LONGWALL COAL-MINING MACHINE

SIC GROUP 12: COAL MINING

TECHNOLOGY: BREAKAGE-FACE LONGWALL COAL-MINING MACHINE

A. DESCRIPTION

THIS TECHNOLOGY ENCOMPASSES THE DEVELOPMENT OF A NEW COAL-MINING MACHINE THAT HAS DEMONSTRATED ITS POTENTIAL CONVINCINGLY, AND SURPASSED OTHER MECHANIZED COAL-MINING SYSTEMS IN NUMEROUS PARAMETERS. THE MACHINE IS MANEUVERABLE, EASY TO CONTROL, AND MET THE REQUIREMENTS FOR SAFE CONDUCT OF UNDERGROUND WORK. IT WORKED SEAMS FROM 2 TO 5 METERS THICK CLEANLY AND DID NOT ALLOW LOSSES OF COAL BELOW GROUND.

B. TECHNOLOGY ADVANTAGES

NONE STATED

SOVIET COMMERCIAL TECHNOLOGIES

SIC GROUP 13: OIL AND GAS EXTRACTION

EXTRACTION TECHNIQUES OF PETROLEUM PRODUCTS (THERMAL, GAS, POLYMER FLOODING)
PRESSURE GENERATORS

SIC GROUP 13: OIL AND GAS EXTRACTION

TECHNOLOGY: EXTRACTION TECHNIQUES OF PETROLEUM PRODUCTS

A. DESCRIPTION

THIS TECHNOLOGY ENCOMPASSES THE DEVELOPMENT OF NOVEL METHODS TO IMPROVE THE EXTRACTION OF PETROLEUM PRODUCTS. THERMAL -BASE SYSTEMS, WITH ENERGY SAVING TECHNOLOGIES FOUNDED ON A COMBINATION OF THERMALLY STIMULATING THE FORMATION AND WATER FLOODING (THERMAL FRINGES), HAVE BEEN CREATED. GAS RECOVERY METHODS INCLUDE INJECTING NITROGEN AND STACK GASES INTO FORMATIONS, AND THE "INTRASTRATAL GENERATION OF CARBON DIOXIDE AND STACK GASES THROUGH MICROBIOLOGICAL, OXIDIZING AND OTHER PROCESSES THAT OCCUR IN THE FORMATIONS.

B. TECHNOLOGY ADVANTAGES

10 PERCENT OF ALL THE WORLD'S OIL RECOVERY IS BEING CONDUCTED THROUGH THE USE OF SUCH NEW METHODS AS HOT-WATER INJECTION, IN-SITU COMBUSTION, AND POLYMER FLOODING.

SIC GROUP 13: OIL AND GAS EXTRACTION

TECHNOLOGY: PRESSURE GENERATORS

A. DESCRIPTION

PRESSURE GENERATORS HAVE BEEN DEVELOPED THAT WORK AT TEMPERATURES UP TO 170 DEGREES CENTIGRADE, DEVELOP UP TO 100 M Pa, AND WORK FOR DEPTHS UP TO 7 km.

B. TECHNOLOGY ADVANTAGES

THESE GENERATORS ARE USED FOR THERMO-CHEMICAL EFFECTS ON BLAST HOLES, AND INCREASE OIL RECOVERY FIVE TO SEVEN TIMES.

SOVIET COMMERCIAL TECHNOLOGIES

SIC GROUP 28: CHEMICALS AND ALLIED PRODUCTS

ALUMINUM OXIDE PRODUCTION PROCESSES
CHLOROFLUOROCARBON PRODUCTION PROCESSES
LASANT MATERIALS (GARNET, ERBIUM:GLASS, Nd:GLASS)
MICROGRAVITY-PROCESSED BIOCRYSTALIZERS
MICROGRAVITY-PROCESSED CELL-PRODUCENTS FOR FEED-STUFF VITAMINS AND ANTIBIOTICS
POLYURETHENE COMPOUNDS
PURIFIED MEDICAL PREPARATIONS
SELF-PROPAGATING HIGH-TEMPERATURE SYNTHESIS
SYNTHETIC RUBBER PRODUCTION PROCESSES (ISOPRENE, CHLOROPRENE)
TURBULENT REACTOR

SIC GROUP 28: CHEMICALS AND ALLIED PRODUCTS

TECHNOLOGY: ALUMINUM OXIDE PRODUCTION PROCESSES

A. DESCRIPTION

NONE STATED

B. TECHNOLOGY ADVANTAGES

THESE PROCESSES PRODUCE SUPER LIGHT-WEIGHT, HIGH-STRENGTH AND HIGH-PRECISION UNITS AND COMPONENTS WITHOUT ADDITIONAL MACHINING. WHEN USED IN ELECTRODYNAMIC TEST RIGS, SUCH PRODUCTS AFFORD A QUANTITATIVELY NEW LEVEL OF TESTING DUE TO THE RETENTION OF VIBRATION CHARACTERISTICS WITH ONLY A MINIMUM OF DISTORTION.

SIC GROUP 28: CHEMICALS AND ALLIED PRODUCTS

TECHNOLOGY: CHLOROFLUOROCARBON PRODUCTION PROCESSES

A. DESCRIPTION

NONE STATED

B. TECHNOLOGY ADVANTAGES

NONE STATED

SIC GROUP 28: CHEMICALS AND ALLIED PRODUCTS

TECHNOLOGY: LASANT MATERIALS (GARNET, ERBIUM:GLASS, Nd:GLASS)

A. DESCRIPTION

THIS TECHNOLOGY ENCOMPASSES THE DEVELOPMENT OF LASER MATERIALS WITH STATE-OF-THE-ART PERFORMANCE AND APPLICATIONS. LASANT MATERIALS INCLUDE GARNET CRYSTALS, ERMIUM:GLASS AND NEODYMIUM:GLASS, ZnGeP2 CRYSTALS, AND LASER DYES.

B. TECHNOLOGY ADVANTAGES

LASANT MATERIAL QUALITY IS CRITICAL TO APPLICATION PERFORMANCE, AS ARE NEW TYPES OF MATERIAL. MATERIAL APPLICATIONS INCLUDE: GARNET CRYSTALS WITH APPLICATIONS IN RANGEFINDERS, MEDICAL LASERS, AND LIDAR; ERBIUM:GLASS AND POSSIBLY NEODYMIUM:GLASS LASERS WITH APPLICATIONS IN RANGEFINDERS, FUSION POWER GENERATION, LIDAR, AND POSSIBLY HIGH-ENERGY LASER WEAPONS; ZnGeP2 CRYSTALS FOR LIDAR APPLICATIONS; AND LASER DYES.

SIC GROUP 28: CHEMICALS AND ALLIED PRODUCTS

TECHNOLOGY: MICROGRAVITY-PROCESSED BIOCRYSTALLIZERS

A. DESCRIPTION

THIS TECHNOLOGY ENCOMPASSES THE PRODUCTION OF SINGLE CRYSTALS OF PROTEINS SUCH AS THE VIRUS OF GRIPPE AND AIDS IN A MICROGRAVITY ENVIRONMENT.

B. TECHNOLOGY ADVANTAGES

NONE STATED

SIC GROUP 28: CHEMICALS AND ALLIED PRODUCTS

TECHNOLOGY: MICROGRAVITY-PROCESSED CELL-PRODUCENTS FOR FEED-STUFF VITAMINS AND ANTIBIOTICS

A. DESCRIPTION

NONE STATED

B. TECHNOLOGY ADVANTAGES

NONE STATED

SIC GROUP 28: CHEMICALS AND ALLIED PRODUCTS

TECHNOLOGY: POLYURETHENE COMPOUNDS

A. DESCRIPTION

THIS TECHNOLOGY ENCOMPASSES THE DEVELOPMENT OF A NEW PROCESS FOR MANUFACTURING GAS-PROOF JUNCTION BOXES WITH THE APPLICATION OF VILAD-13 POLYURETHENE COMPOUND.

B. TECHNOLOGY ADVANTAGES

THE VILAD-13 POLYURETHENE COMPOUND IS TWICE AS EFFECTIVE AS ELAST COMPOUNDS.

SIC GROUP 28: CHEMICALS AND ALLIED PRODUCTS

TECHNOLOGY: PURIFIED MEDICAL PREPARATIONS

A. DESCRIPTION

THIS TECHNOLOGY ENCOMPASSES THE PRODUCTION OF VACCINES FOR CURING HEPATITUS B, ETC, IN A MICROGRAVITY ENVIRONMENT.

B. TECHNOLOGY ADVANTAGES

NONE STATED

SIC GROUP 28: CHEMICALS AND ALLIED PRODUCTS

TECHNOLOGY: SELF-PROPAGATING HIGH-TEMPERATURE SYNTHESIS

A. DESCRIPTION

THIS TECHNOLOGY ENCOMPASSES THE DEVELOPMENT OF A PROCESS WHICH LOCALLY IGNITES RAW MATERIAL (IN A GAS, LIQUID, OR POWDER STAGE) IN AN ENCLOSED PRESSURIZED CHAMBER. THE MATERIAL SELF-COMBUSTS WITH THE PROPAGATION DIRECTION OF THE COMBUSTION WAVE BEING CONTROLLED. PRESSURE ON THE REACTANT MATERIAL IS USUALLY MAINTAINED BY MECHANICAL, GAS OR HYDROSTATIC PRESSURE, AND ACTS TO PREVENT MATERIAL EXPANSION. IT ALSO PROMOTES IMPROVED MATERIAL DIFFUSION AND DENSIFICATION.

B. TECHNOLOGY ADVANTAGES

MATERIAL DENSITIES ACHIEVED BY THIS METHOD (WITHOUT POST-MECHANICAL DEFORMATION) APPROACH 90-95% OF THEORETICAL DENSITY. SHS APPLICATIONS INCLUDE BOTH PRODUCTION OF MATERIAL COMPOUNDS AND A POWDER COMPACTION TECHNIQUE FOR NEAR- OR NET-SHAPE COMPONENT FABRICATION.

SIC GROUP 28: CHEMICALS AND ALLIED PRODUCTS

TECHNOLOGY: SYNTHETIC RUBBER PRODUCTION PROCESSES

A. DESCRIPTION

HEAT CONDUCTIVE RUBBER MIXTURE T PC-9 IS DESIGNED FOR PRODUCING DIELECTRIC HEAT CONDUCTIVE GASKETS. T PC-9 IS A SINGLE-COMPONENT RAW RUBBER MIXTURE. IT CAN BE MANUFACTURED INTO ITEMS .3-2mm IN THICKNESS BY HOT PRESS VULCANIZATION.

B. TECHNOLOGY ADVANTAGES

T PC-9 MATERIAL IS NON-TOXIC, NON-CORROSION ACTIVE, AND HAS A STORAGE LIFE OF NO LESS THAN SIX MONTHS, WITH A SERVICE LIFE OF NO LESS THAN 12 YEARS.

SIC GROUP 28: CHEMICALS AND ALLIED PRODUCTS

TECHNOLOGY: TURBULENT REACTOR

A. DESCRIPTION

THIS TECHNOLOGY ENCOMPASSES THE DEVELOPMENT OF SUPERFAST CHEMICAL REACTIONS IN TURBULENT CURRENTS SUCH AS OLIGOMERIZATION, ALKYLBENZINATION, CHLORINATION, HYDROCHLORINATION AND OTHER FAST CHEMICAL REACTIONS HAS BEEN DEVELOPED ON AN INDUSTRIAL SCALE.

B. TECHNOLOGY ADVANTAGES

ONE MICROREACTOR WEIGHS 50 kg BUT HAS THE SAME PRODUCTIVITY AT 3/4 THE ENERGY EXPENDITURE OF A 40 TON STANDARD U.S. REACTOR. THE TECHNOLOGY LOWERS PRODUCTION SPACE REQUIREMENTS, LABOR EXPENDITURE, IS SIMPLY CONSTRUCTED, DEPENDABLE AND IMPROVES THE QUALITY OF THE FINAL PRODUCT.

SOVIET COMMERCIAL TECHNOLOGIES

SIC GROUP 30: RUBBER AND MISCELLANEOUS PLASTICS PRODUCTS

CARBON ADHESIVES
CARBON-CARBON PRODUCTS
COMPONERS
METAL SUPERPLASTICITY
ROLIVSANS THERMOSETTING CAST RESINS
STRUCTURAL CARBON AND ORGANIC FIBER REINFORCED PLASTICS AND THERMOPLASTICS (BORON-CARBON)

SIC GROUP 30: RUBBER AND MISCELLANEOUS PLASTICS PRODUCTS

TECHNOLOGY: CARBON ADHESIVES

A. DESCRIPTION

HEAT CONDUCTIVE ADHESIVE TKJT-150 IS DESIGNED FOR THE ASSEMBLY OF MICROCIRCUIT PACKAGES AND RADIOACTIVE ELEMENTS. IT IS A TWO COMPONENT COMPOUND WITH MODIFIED FILLERS WHICH HAVE STABLE THERMAL PHYSICAL PROPERTIES IN THE CURING STATE. THE ADHESIVE CAN BE USED ON METAL OR CERAMIC MATERIALS AT ROOM TEMPERATURE.

B. TECHNOLOGY ADVANTAGES

THIS ADHESIVE IS COMPATABLE WITH MOISTURE PROTECTIVE VARNISHES AND ENAMELS. PARTS MOUNTED WITH THIS ADHESIVE CAN WITHSTAND LINEAR ACCELERATION TO 30 g, AND MULTIPLE IMPACT LOADS AT 400-2000 Hr FREQUENCY.

SIC GROUP 30: RUBBER AND MISCELLANEOUS PLASTICS PRODUCTS

TECHNOLOGY: CARBON-CARBON PRODUCTS

A. DESCRIPTION

THIS MATERIAL IS USED FOR THE MANUFACTURE OF PIPES, DUCTS, ELEMENTS OF HEAT-EXCHANGES, BEARINGS, AND OTHER ITEMS. THIS COMPOSITE IS RESISTANT TO AGGRESSIVE MEDIA AT HIGH TEMPERATURES, METAL AND ALLOY SMELTS, AND HIGH TEMPERATURES IN INERT MEDIA.

B. TECHNOLOGY ADVANTAGES

THE HEAT AND SHOCK RESISTANCE OF THIS MATERIAL IS TEN TIMES HIGHER THAT THAT OF GRAPHITE. THIS COMPOSITE WILL RESULT IN INCREASED RELIABILITY AND A SUBSTANTIAL INCREASE IN THE SERVICE LIFE OF PRODUCTS MANUFACTURED FROM CARBON-CARBON.

SIC GROUP 30: RUBBER AND MISCELLANEOUS PLASTICS PRODUCTS

TECHNOLOGY: COMPONERS

A. DESCRIPTION

THIS TECHNOLOGY ENCOMPASSES THE PRODUCTION OF COMPOSITE MATERIALS BASED ON FILLER DURING THE POLYMERIZATION PROCESS HAS BEEN DEVELOPED ON AN INDUSTRIAL LEVEL.

B. TECHNOLOGY ADVANTAGES

VARIOUS MONOMERS AND FILLERS CAN BE USED. FILLER CONTENT UP TO 97% IS POSSIBLE. SOME COMPONER MATERIALS INCLUDE TYPE "C" ENGINEERING THERMOPLASTIC, THERMAL INSULATION, HEAT SINK MATERIAL WITH HIGH THERMAL CONDUCTIVITY BUT NO ELECTRICAL CONDUCTIVITY, INEXPENSIVE COMPRESSION MOLDED FERRITES, FILTERS FOR SEPARATING WATER FROM OIL, AND ARTIFICAL BONE.

SIC GROUP 30: RUBBER AND MISCELLANEOUS PLASTICS PRODUCTS

TECHNOLOGY: METAL SUPERPLASTICITY

A. DESCRIPTION

THIS TECHNOLOGY ENCOMPASSES THE DEVELOPMENT OF A NEW ECONOMICAL PROCESS TO MANUFACTURE BULK, AXIALLY SYMMETRIC/BODIES OF ROTATION/PARTS UNDER THE CONDITIONS OF SUPERPLASTICITY OUT OF HARD TO DEFORM AND REDUCED PLASTICITY STEELS AND ALLOYS. THE FORMING PROCESS IS CARRIED OUT ON UNIVERSALLY APPLIED EQUIPMENT WITH THE HELP OF AN INEXPENSIVE AND SIMPLE TO MANUFACTURE MACHINE. UNIFIED ROUND FORGED IN A DIE BLANKS (OR PRESS FORGED) ARE USED AS INITIAL PARTS.

B. TECHNOLOGY ADVANTAGES

NONE STATED

SIC GROUP 30: RUBBER AND MISCELLANEOUS PLASTICS PRODUCTS

TECHNOLOGY: ROLIVSANS THERMOSETTING CAST RESINS

A. DESCRIPTION

THIS TECHNOLOGY ENCOMPASSES THE PREPARATION OF ROLIVSANS. THE PREPARATION PROCESS IS SIMILAR TO THAT FOR UNSATURATED POLYESTERS. HOWEVER, PROCESSING DIFFERENCES INCLUDE NO USE OF SOLVENTS, NO EVOLUTION OF VOLATILE BY-PRODUCTS, NO DIFFICULTIES IN MAKING CASTINGS, MOLDINGS, SEALINGS, ETC., AND NO USING HIGH PRESSURE AND TEMPERATURE.

B. TECHNOLOGY ADVANTAGES

MATERIAL PROPERTIES INCLUDE LOW VISCOSITY (500-5000 cps AT 25 deg C), LOW MELTING POINT (15-75 deg C) AND LOW DENSITY (1.1 g/cubic cm) FOR INITIAL SYSTEMS.

SIC GROUP 30: RUBBER AND MISCELLANEOUS PLASTICS PRODUCTS

TECHNOLOGY: STRUCTURAL CARBON AND ORGANIC FIBER REINFORCED PLASTICS/THERMOPLASTICS

A. DESCRIPTION

NONE STATED

B. TECHNOLOGY ADVANTAGES

NONE STATED

SOVIET COMMERCIAL TECHNOLOGIES

SIC GROUP 33: PRIMARY METAL INDUSTRIES

DYNAMIC COMPACTION SYNTHESIS
ELASTOMERIC ROLL FORMING OF SHEET METAL
FILAMENT WINDING OF THICK SECTION COMPOSITES FABRICATION PROCESSES
IMPULSE PROCESSING METHOD
PLASMA-MECHANICAL METAL PROCESSING
SPECIALTY STEEL PLASMA-CONDITIONING SYSTEMS
TITANIUM ALLOYS
VACUUM PROCESSING OF STEEL WITH SYNTHETIC SLAG AND INERT GASES
WELDABLE ALUMINUM-LITHIUM (Al-Li) ALLOYS

SIC GROUP 33: PRIMARY METAL INDUSTRIES

TECHNOLOGY: DYNAMIC COMPACTION SYNTHESIS

A. DESCRIPTION

THIS TECHNOLOGY ENCOMPASSES THE METHODS WHEREBY MATERIALS IN POWDERED FORM ARE DYNAMICALLY COMPRESSED AND SINTERED TO FORM SOLID OBJECTS. THE USE OF EXPLOSIVES HAS BEEN FOUND TO BE A PARTICULARLY EFFECTIVE SINTERING MECHANISM FOR MANY MATERIALS. DYNAMIC COMPACTION LEADS TO MORE UNIFORM STRUCTURE AND STRENGTH CHARACTERISTICS FOR THE SINTERED OBJECTS THAN ALTERNATIVE COMPOSITES (CERAMICS BONDED TO METALS, ETC.).

B. TECHNOLOGY ADVANTAGES

A SOPHISTICATED UNDERSTANDING OF THE PHYSICS OF WAVE PROPAGATION IN GRANULAR MATERIALS, INFLUENCE OF MICROSTRUCTURE, AND ELASTIC AND INELASTIC RESPONSE OF BULK MATERIALS AND THEIR RELATIONSHIPS IS CRUCIAL TO THE SELECTION OF INITIAL CONDITIONS (SUCH AS EXPLOSIVE LOAD, DETONATION METHODS, GEOMETRICAL CONFIGURATION OF BOTH POWDER AND EXPLOSIVES, AND GRAIN SIZE AND PACKING ORDER) THAT PROMOTE UNIFORMITY AND CRACK CONTROL DURING UNLOADING.

SIC GROUP 33: PRIMARY METAL INDUSTRIES

TECHNOLOGY: ELASTOMERIC ROLL FORMING OF SHEET METAL

A. DESCRIPTION

THIS TECHNOLOGY ALLOWS ONE-STEP, PRECISE FORMING OF SHEET PARTS FROM COMMON AEROSPACE ALLOYS WHICH MAY HAVE BEEN PERFORATED, COATED OR PREVIOUSLY THINNED THROUGH CHEMICAL MILLING; PERFORMS SIMULTANEOUS BENDING AND PERFORATING, OR BENDING AND CORRUGATING OF SHEET PARTS; REQUIRES FEWER STEPS PER OPERATION, MINIMUM OPERATOR SKILL, AND SIMPLE TOOLING; AND RESUTS IN SIGNIFICANT PRODUCTION COST SAVINGS.

B. TECHNOLOGY ADVANTAGES

TWO-ROLL ELASTOMERIC FORMING HAS REALIZED A 71% COST SAVINGS OVER CONVENTIONAL THREE-ROLL SHEET FORMING METHODS. PRECISE PART SHAPES PROVIDE ACCURATE WELD SEAM GAPS, WITH SAVINGS DURING SUBSEQUENT WELDING OPERATIONS. THIS PROCESS CAN BE USED TO PRODUCE VERY ACCURATE FLAT, CYLINDRICAL OR CONICAL PARTS WITH PRODUCTION RATES FROM 100 TO 120 PIECES PER HOUR. THIS TECHNOLOGY HAS BEEN USED TO FORM AIRFOIL COMPONENTS FOR TURBINE ENGINES.

SIC GROUP 33: PRIMARY METAL INDUSTRIES

TECHNOLOGY: FILAMENT WINDING OF THICK SECTION COMPOSITES FABRICATION PROCESSES

A. DESCRIPTION

THIS TECHNOLOGY ENCOMPASSES THE DEVELOPMENT OF A COMPOSITE FABRICATION PROCESS WHICH CONSISTS OF WINDING A CONTINUOUS REINFORCEMENT (IMPREGNATED WITH RESIN) AROUND A ROTATING AND REMOVABLE FORM (MANDREL).

B. TECHNOLOGY ADVANTAGES

SUCCESFUL WINDING OF GREATER THICKNESS AND LARGER DIAMETER COMPOSITES.

SIC GROUP 33: PRIMARY METAL INDUSTRIES

TECHNOLOGY: IMPULSE PROCESSING METHOD

A. DESCRIPTION

THIS TECHNOLOGY, BASED ON THE USE OF EXPLOSIVE ENERGY, HIGH VOLTAGE CHARGES AND HIGH INTENSITY MAGNETIC FIELD IMPULSES, MAKES IT POSSIBLE TO TREAT MATERIAL WITH HIGH ENERGY POWER AND PRESSURE.

B. TECHNOLOGY ADVANTAGES

THIS TECHNOLOGY IS ESPECIALLY SUITED FOR PRODUCING COMPLEX SHAPES FOR SHEET FORMING, DIE FORGING, METAL CUTTING, ETC.

SIC GROUP 33: PRIMARY METAL INDUSTRIES

TECHNOLOGY: PLASMA-MECHANICAL METAL PROCESSING

A. DESCRIPTION

THIS TECHNOLOGY IS BASED ON WEAKENING THE CUTTING SURFACE WITH A PLASMA ARC OF ACTIVE GASES.

B. TECHNOLOGY ADVANTAGES

THIS METHOD SIGNIFICANTLY REDUCES LOADS AT THE CUT AND INCREASES ITS DURABILITY SIX TO EIGHT TIMES. IT INCREASES THE CUTTING SPEED FOR TITANIUM, HIGH MANGANESE, STAINLESS, ALLOY-TREATED, HEAT TREATED, AND HEAT RESISTANT STEEL BY FIVE TO THIRTY TIMES; LOW CARBON AND LIGHTLY ALLOY-TREATED STEEL -- TWO TO THREE TIMES; AND WEAR RESISTANCE COATINGS -- FOUR TO SEVEN TIMES.

SIC GROUP 33: PRIMARY METAL INDUSTRIES

TECHNOLOGY: SPECIALTY STEEL PLASMA-CONDITIONING SYSTEMS

A. DESCRIPTION

THIS TECHNOLOGY ENCOMPASSES THE DEVELOPMENT OF AN ENVIRONMENTALLY SOUND METHOD OF CONDITIONING SPECIALTY STEEL SURFACES WITHOUT METAL LOSS. THE SYSTEM HAS APPLICATIONS FOR PROCESSORS OF AEROSPACE AND OTHER CRITICAL MATERIALS.

B. TECHNOLOGY ADVANTAGES

NONE STATED

SIC GROUP 33: PRIMARY METAL INDUSTRIES

TECHNOLOGY: TITANIUM ALLOYS

A. DESCRIPTION

THIS TECHNOLOGY ENCOMPASSES MATERIALS ENGINEERING AND INDUSTRIAL FABRICATION OF VERY HIGH STRENGTH STEELS AND THICK-SECTION TITANIUM ALLOYS.

B. TECHNOLOGY ADVANTAGES

NONE STATED

SIC GROUP 33: PRIMARY METAL INDUSTRIES

TECHNOLOGY: VACUUM PROCESSING OF STEEL WITH SYNTHETIC SLAG AND INERT GASES

A. DESCRIPTION

THIS TECHNOLOGY ENCOMPASSES METHODS OF VACUUM PROCESSING OF STEEL WITH SYNTHETIC SLAG AND INERT GASES.

B. TECHNOLOGY ADVANTAGES

THIS TECHNOLOGY IS ESPECIALLY EFFECTIVE IN ENHANCING THE PURITY AND HOMOGENEITY OF PRODUCTS.

SIC GROUP 33: PRIMARY METAL INDUSTRIES

TECHNOLOGY: WELDABLE ALUMINUM-LITHIUM (Al-Li) ALLOYS

A. DESCRIPTION

THIS TECHNOLOGY ENCOMPASSES THE DESIGN APPLICATION AND PRODUCTION OF WELDED ALUMINUM-LITHIUM (Al-Li) ALLOY COMPONENTS FOR AEROSPACE VEHICLES. THE SOVIET METHOD INVOLVES THE USE OF POST-WELD HEAT TREATMENT AND OTHER MEASURES, WHICH HAVE NOT BEEN DISCLOSED IN DETAIL, BUT HAVE BEEN OFFERED FOR SALE.

B. TECHNOLOGY ADVANTAGES

THE LOWER DENSITY AND HIGH STRENGTH GAINED BY THE ADDITION OF LITHIUM TO ALUMINUM ALLOYS OFFER SIGNIFICANT SPECIFIC STIFFNESS IMPROVEMENTS AND WEIGHT SAVINGS RANGING FROM 10 - 30% OVER CONVENTIONAL ALUMINUM ALLOYS (DEPENDING UPON DEGREE OF ALLOY INTEGRATION INTO STRUCTURAL DESIGN). A MAJOR FACTOR LIMITING APPLICATION OF WELDED Al-Li CONSTRUCTION IS THE LOSS OF STRENGTH IN THE WELDED ZONE, WHICH CAN REACH LOSSES OF 25 - 30 PERCENT. THE SOVIET METHOD RESULTS IN LOSSES OF 10% IN STRENGTH.

SOVIET COMMERCIAL TECHNOLOGIES

SIC GROUP 34: FABRICATED METAL PRODUCTS, EXCEPT MACHINERY AND TRANSPORTATION EQUIPMENT

ROTARY-PLANETARY MILL MACHINE
SMALL NUCLEAR POWER REACTORS

SIC GROUP 34: FABRICATED METAL PRODUCTS, EXCEPT MACHINERY AND TRANSPORTATION EQUIPMENT

TECHNOLOGY: ROTARY-PLANETARY MILL MACHINE

A. DESCRIPTION

THIS TECHNOLOGY ENCOMPASSES THE DEVELOPMENT OF A ROTARY-PLANETARY MILL THAT PRODUCES THE FOLLOWING BILLETS: ROUND BILLETS WITH A DIAMETER OF 100-150 mm, SQUARE BILLETS WITH AN 80-120 mm SIDE, AND 70x90- TO 105x140- mm RECTANGULAR BILLETS.

B. TECHNOLOGY ADVANTAGES

THE DESIGN OF THE ROLLING MILL MAKES IT POSSIBLE TO REDUCE ROLL CHANGING TIME TO BETWEEN ONE-FIFTH AND ONE-TENTH OF WHAT IT ORDINARILY IS AND TO INCREASE BEARING LIFE SEVERAL TIMES OVER. ADDITIONALLY, THE RPS HAS 2-3 FOLD HIGHER DRAWING OF THE METAL BEING ROLLED AND A HIGHER QUALITY OF THE METAL AFTER ROLLING.

SIC GROUP 34: FABRICATED METAL PRODUCTS, EXCEPT MACHINERY AND TRANSPORTATION EQUIPMENT

TECHNOLOGY: SMALL NUCLEAR POWER REACTORS

A. DESCRIPTION

THIS TECHNOLOGY ENCOMPASSES THE DEVELOPMENT OF SMALL NUCLEAR POWER REACTORS. THE "TOPAZ" POWER SYSTEM IS A SPACE POWER SYSTEM FOR SUPPLYING APPROXIMATELY 6–7 kW ELECTRIC POWER. THE REACTOR USES IN-CORE THERMIONIC CONVERSION, URANIUM FUEL, ZIRCONIUM HYDRIDE MODERATOR, AND BERYLLIUM METAL REFLECTORS.

B. TECHNOLOGY ADVANTAGES

THE "TOPAZ" REACTOR UTILIZES THE HIGHER EFFICIENCY STATIC ENERGY CONVERSION CONCEPT KNOWN AS "ELECTRIC THERMO-EMISSION" OR "THERMIONICS". PRELIMINARY CALCULATIONS FOR A 30 kW ELECTRIC SPACE POWER SYSTEM HAVE ALREADY BEEN COMPLETED BASED ON USING THIS TECHNOLOGY. THE SOVIETS BELIEVE THEY CAN IMPROVE THIS REACTOR TO PROVIDE SEVERAL HUNDRED KILOWATTS AND OPERATE FOR FIVE YEARS OR MORE.

SOVIET COMMERCIAL TECHNOLOGIES

SIC GROUP 35: INDUSTRIAL AND COMMERCIAL MACHINERY AND COMPUTER EQUIPMENT

DIESEL ENGINES
FIBER OPTICS MODULE FOR AUTOMATIC CONTROL SYSTEMS
MULTIPLE-REFLECTION OPTICAL SYSTEMS
OPTICAL COMPUTING / INFORMATION PROCESSING
WAVEGUIDE HOLOGRAMS

SIC GROUP 35: INDUSTRIAL AND COMMERCIAL MACHINERY AND COMPUTER EQUIPMENT

TECHNOLOGY: DIESEL ENGINES

A. DESCRIPTION

THIS TECHNOLOGY ENCOMPASSES DEVELOPMENT OF DIESEL ENGINES.

B. TECHNOLOGY ADVANTAGES

CERTIFICATION TESTS CONDUCTED IN THE U.S. OF THE SOVIET SMD-2 DIESEL ENGINE SHOWED THAT IT IS MORE ECONOMICAL THAN THE BEST AMERICAN AND EUROPEAN DIESELS OF THE SAME CLASS.

SIC GROUP 35: INDUSTRIAL AND COMMERCIAL MACHINERY AND COMPUTER EQUIPMENT

TECHNOLOGY: FIBER OPTICS MODULE FOR AUTOMATIC CONTROL SYSTEMS

A. DESCRIPTION

THIS TECHNOLOGY ENCOMPASSES THE DEVELOPMENT OF A FIBER OPTICS MODULE, TYPE MKIRI-2, TO AUTOMATICALLY CONTROL THE WEAR OF CUTTING INSTRUMENTS WHEN TURNING PARTS IN FLEXIBLE PRODUCTION SYSTEMS, NUMERICALLY CONTROLLED MACHINE-TOOL SYSTEMS, ROBOT-TECHNINCAL COMPLEXES AND OTHER MACHINE-TOOL SYSTEMS.

B. TECHNOLOGY ADVANTAGES

MEASUREMENT ERROR HAS BEEN REDUCED TO ONE MICROMETER WITH A MEASUREMENT FORCE OF 6 NEWTONS.

SIC GROUP 35: INDUSTRIAL AND COMMERCIAL MACHINERY AND COMPUTER EQUIPMENT

TECHNOLOGY: MULTIPLE-REFLECTION OPTICAL SYSTEMS

A. DESCRIPTION

THIS TECHNOLOGY ENCOMPASSES THE DEVELOPMENT OF OVER 30 HIGHLY SENSITIVE AND HIGH-PRECISION RELIABLE AND SHAKE-PROOF OPTICAL SYSTEMS OF MULTIPLE REFLECTION HAVE BEEN DESIGNED.

B. TECHNOLOGY ADVANTAGES

THESE UNIQUE INSTRUMENTS CAN DETERMINE THE SLIGHTEST CHANGES IN AIR COMPOSITION AND MODEL CONSEQUENCES OF HUMAN INFLUENCES ON NATURE. THE INSTRUMENTS CAN BE USED TO HELP CUSTOMS TO SPOT DRUGS AND EXPLOSIVES, INSTEAD OF SPECIALLY TRAINED DOGS.

SIC GROUP 35: INDUSTRIAL AND COMMERCIAL MACHINERY AND COMPUTER EQUIPMENT

TECHNOLOGY: OPTICAL COMPUTING / INFORMATION PROCESSING

A. DESCRIPTION

THIS TECHNOLOGY ENCOMPASSES OPTIMAL COMPUTING / OPTICAL INFORMATION PROCESSING, AND CONSISTS OF OPTICAL METHODS OF PROCESSING DATA, INCLUDING FIBER OPTICS AND WAVE GUIDES; PHOTOELECTRIC COMPONENTS (DETECTORS, TRANSDUCERS, ETC.); OPTICAL STORAGE MEDIA / OPTICAL READ / WRITE METHODS; AND SLM AND OTHER COMPONENTS.

B. TECHNOLOGY ADVANTAGES

NONE STATED

SIC GROUP 35: INDUSTRIAL AND COMMERCIAL MACHINERY AND COMPUTER EQUIPMENT

TECHNOLOGY: WAVEGUIDE HOLOGRAMS

A. DESCRIPTION

THIS TECHNOLOGY ENCOMPASSES THE DEVELOPMENT OF OPTICAL DEVICES WHICH CAN PERFORM PARTICULAR TYPES OF OPTICAL PROCESSING, INCLUDING OPTICAL CORRELATION AND CERTAIN TYPES OF DIGITAL COMPUTER OPERATIONS.

B. TECHNOLOGY ADVANTAGES

WAVEGUIDE HOLOGRAMS CAN BE INCORPORATED INTO INTEGRATED OPTICS UNITS TO DRAMATICALLY INCREASE THEIR UTILITY.

SOVIET COMMERCIAL TECHNOLOGIES

SIC GROUP 36: ELECTRONIC AND OTHER ELECTRICAL EQUIPMENT AND COMPONENTS EXCEPT COMPUTER EQUIPMENT

DISK EXPLOSIVE MAGNETIC GENERATORS
ELECTRON-BEAM-PUMPED SEMICONDUCTOR LASERS
EXPLOSIVE MAGNETOHYDRODYNAMIC GENERATORS
HIGH BRIGHTNESS NEGATIVE ION SOURCES
HIGH MAGNETIC FIELD GENERATOR
HIGH POWER GAS LASERS
HIGH POWER GLASS LASERS
HIGH POWER MICROWAVE GENERATORS
HIGH POWER RF HEATERS FOR IONOSPHERIC MODIFICATION
HIGH POWER RF TUBES
LASER INSTRUMENTATION
MAGNETIC FLUX COMPRESSION GENERATOR
MICROGRAVITY-PROCESSED ULTRA-PURE SEMICONDUCTOR SINGLE CRYSTALS (GaAs, Ge, CdTe, Si)
PULSED POWER TECHNOLOGIES
PULSED WAVE DE-ICING / ANTI-ICING EQUIPMENT
SPATIAL LIGHT MODULATORS
TACITRONS
VACUUM MICROELECTRONICS

SIC GROUP 36: ELECTRONIC AND OTHER ELECTRICAL EQUIPMENT AND COMPONENTS EXCEPT COMPUTER EQUIPMENT

TECHNOLOGY: DISK EXPLOSIVE MAGNETIC GENERATORS

A. DESCRIPTION

THIS TECHNOLOGY ENCOMPASSES THE DEVELOPMENT OF AN EXPLOSIVE PULSE POWER SYSTEM GENERATING VERY HIGH CURRENTS AND VERY LARGE ELECTRICAL ENERGIES. IT HAS DEMONSTRATED WORLD RECORD ELECTRICAL PERFORMANCE SIMULTANEOUSLY IN BOTH CURRENT (250–300 MA) AND ENERGY (90–100 MJ). IT ALSO OUTPERFORMS OTHER SYSTEMS BY DELIVERING A FAST OUTPUT PULSE (20 usec).

B. TECHNOLOGY ADVANTAGES

THE DISK EXPLOSIVE MAGNETIC GENERATOR HAS A NUMBER OF ADVANTAGES FOR VERY HIGH CURRENT APPLICATIONS INCLUDING RELATIVELY LOW LOSS, RELATIVELY HIGH INDUCTANCE TO EXPLOSIVE RATIO AND VERY EFFICIENT CONVERSION OF EXPLOSIVE TO ELECTRICAL ENERGY.

SIC GROUP 36: ELECTRONIC AND OTHER ELECTRICAL EQUIPMENT AND COMPONENTS EXCEPT COMPUTER EQUIPMENT

TECHNOLOGY: ELECTRON-BEAM-PUMPED SEMICONDUCTOR LASERS

A. DESCRIPTION

THIS TECHNOLOGY ENCOMPASSES THE DEVELOPMENT OF SEMICONDUCTOR LASERS COMPOSED OF LAYERS OF p-TYPE AND n-TYPE MATERIALS FABRICATED ON A GALLIUM ARSENIDE, ZINC SELENITE, OR SILICON WAFER. THE DEVICE EMITS COHERENT LIGHT PERPENDICULAR TO THE WAFER WHEN IMPACTED BY AN ELECTRON BEAM ON THE OPPOSITE SIDE. UNLIKE INJECTION LASERS, EBPSLs EMIT RADIATION IN THE VISIBLE SPECTRUM.

B. TECHNOLOGY ADVANTAGES

NONE STATED

SIC GROUP 36: ELECTRONIC AND OTHER ELECTRICAL EQUIPMENT AND COMPONENTS EXCEPT COMPUTER EQUIPMENT

TECHNOLOGY: EXPLOSIVE MAGNETOHYDRODYNAMIC GENERATORS

A. DESCRIPTION

THIS TECHNOLOGY ENCOMPASSES THE DEVELOPMENT OF PULSED OR BURST MHD GENERATORS DRIVEN BY CHEMICAL, NUCLEAR, OR THERMONUCLEAR DETONATIONS OR ANY PULSED FLUCTUATING SOURCE OF CONDUCTING FLUID TO PRODUCE A PULSED ELECTRICAL OUTPUT. THE FASTER THE CONDUCTING FLUID MOVES DOWN THE CONDUCTING CHANNEL THE HIGHER THE ENERGY CONTENT, THEREBY MAXIMIZING ENERGY OUTPUT BY ACHIEVING A STRONG INTERACTION BETWEEN THE FLUID AND MAGNETIC FIELD.

B. TECHNOLOGY ADVANTAGES

PROMISING RESEARCH IS BEING CONDUCTED IN HIGH INTERACTION CONCEPTS INVOLVING VARIOUS EXPLOSIVELY DRIVEN DEVICES PRODUCING MEGAJOULE ENERGIES AT POWER LEVELS UP TO THE GIGAWATT RANGE. REPETITIVELY OPERATED DEVICES ARE UNDER INVESTIGATION USING EXPLOSIVES. APPLICATIONS INCLUDE RAILGUNS, INTENSE OPTICAL SOURCES, AND SEISMOLOGY.

SIC GROUP 36: ELECTRONIC AND OTHER ELECTRICAL EQUIPMENT AND COMPONENTS EXCEPT COMPUTER EQUIPMENT

TECHNOLOGY: HIGH BRIGHTNESS NEGATIVE ION SOURCE

A. DESCRIPTION

THIS TECHNOLOGY ENCOMPASSES THE DEVELOPMENT OF DIRECT EXTRACTION SOURCES CONSISTING OF SURFACE PLASMA (OR PRODUCTION) SOURCES (SPS), AND VOLUME PLASMA (OR PRODUCTION) SOURCES (VPS). THE VPS IS ALSO KNOWN AS THE MAGNETRON ION SOURCE. THE VPS PRIMARILY GENERATES NEGATIVE HYDROGEN IONS THROUGH A PLASMA VIBRATION IONIZING THE HYDROGEN GAS, WHEREAS THE THERMAL VIBRATION OF THE ELECTRODE SURFACE IN THE SPS EJECTS THE NEGATIVE HYDROGEN IONS. THE RESULT IS A MUCH LOWER TRANSVERSE ENERGY FOR THE VPS GENERATED IONS, THUS ALLOWING FOR GREATER BRIGHTNESS.

B. TECHNOLOGY ADVANTAGES

THE HIGH BRIGHTNESS ALLOWS FOR FINE CONTROL OF THE ION BEAM, FOR USE IN THE ION DEPOSITION OF SEMICONDUCTOR COMPONENTS, SPACE ION THRUSTERS, AND HIGH ENERGY ION ACCELERATORS.

SIC GROUP 36: ELECTRONIC AND OTHER ELECTRICAL EQUIPMENT AND COMPONENTS EXCEPT COMPUTER EQUIPMENT

TECHNOLOGY: HIGH MAGNETIC FIELD GENERATORS

A. DESCRIPTION

THIS TECHNOLOGY ENCOMPASSES THE DEVELOPMENT OF HIGH MAGNETIC FIELD GENERATORS THAT PRODUCE ULTRA-HIGH MAGNETIC FIELDS BY USING HIGH EXPLOSIVES TO COMPRESS AN INITIAL MAGNETIC FLUX. PEAK MAGNETIC FIELDS OF 10-13 MEGAGAUSS ARE GENERATED IN CYLINDRICAL VOLUMES OF 5-10 mm DIAMETERS AND LENGTHS OF 10 cm.

B. TECHNOLOGY ADVANTAGES

NONE STATED

SIC GROUP 36: ELECTRONIC AND OTHER ELECTRICAL EQUIPMENT AND COMPONENTS EXCEPT COMPUTER EQUIPMENT

TECHNOLOGY: HIGH POWER GAS LASERS

A. DESCRIPTION

THIS TECHNOLOGY ENCOMPASSES THE DEVELOPMENT OF HIGH POWER GAS LASERS. THE SOVIETS HAVE INDICATED THAT CO2 LASERS OF UP TO 100KW MIGHT BE AVAILABLE FOR PURCHASE.

B. TECHNOLOGY ADVANTAGES

UNIQUE LASER CAVITY DESIGNS AND PUMPING TECHNIQUES.

SIC GROUP 36: ELECTRONIC AND OTHER ELECTRICAL EQUIPMENT AND COMPONENTS EXCEPT COMPUTER EQUIPMENT

TECHNOLOGY: HIGH POWER GLASS LASERS

A. DESCRIPTION

NONE STATED

B. TECHNOLOGY ADVANTAGES

NONE STATED

SIC GROUP 36: ELECTRONIC AND OTHER ELECTRICAL EQUIPMENT AND COMPONENTS EXCEPT COMPUTER EQUIPMENT

TECHNOLOGY: HIGH-POWER MICROWAVE GENERATORS

A. DESCRIPTION

THIS TECHNOLOGY ENCOMPASSES THE DEVELOPMENT OF MICROWAVE AND MILLIMETER-WAVE GENERATORS WITH PEAK OUTPUT POWERS OF MORE THAN 100 MW.

B. TECHNOLOGY ADVANTAGES

NONE STATED

SIC GROUP 36: ELECTRONIC AND OTHER ELECTRICAL EQUIPMENT AND COMPONENTS EXCEPT COMPUTER EQUIPMENT

TECHNOLOGY: HIGH POWER RF HEATERS FOR IONOSPHERIC MODIFICATION

A. DESCRIPTION

THIS TECHNOLOGY IS USED TO CREATE AN ARITFICIAL IONOSPHERIC MIRROR (AIM) WHICH CAN BE USED TO REFLECT AND REFRACT ENERGY AT VIRTUALLY ANY ALTITUDE AND AT MUCH HIGHER FREQUENCIES (VHF/UHF) THAN THE NATURAL IONOSPHERE (WHICH IS LIMITED TO HF FREQUENCIES).

B. TECHNOLOGY ADVANTAGES

AIM PATCHES CAN BE CREATED IN THE UPPER ATMOSPHERE (50–70 km) BY USING CROSS BEAMS FROM TWO OR MORE VERY HIGH POWER RF HEATERS (GIGAWATT LEVEL) TO GENERATE A DENSE PLASMA ZONE POTENTIALLY CAPABLE OF REFLECTING MICROWAVE SIGNALS.

SIC GROUP 36: ELECTRONIC AND OTHER ELECTRICAL EQUIPMENT AND COMPONENTS EXCEPT COMPUTER EQUIPMENT

TECHNOLOGY: HIGH POWER RF TUBES

A. DESCRIPTION

THIS TECHNOLOGY ENCOMPASSES THE DEVELOPMENT OF DEVICES WHICH PRODUCE MICROWAVE RADIATION WITH HIGH EFFICIENCY AT PULSE POWERS GREATER THAN 1 MW AND CW POWERS GREATER THAN 50 KW.

B. TECHNOLOGY ADVANTAGES

THE SOVIETS LEAD IN THE FOLLOWING ASPECTS OF THIS TECHNOLOGY: OUTPUT POWER IN BOTH PULSE AND CW TRANSMISSION, LARGE CATHODE DESIGN, PLASMA FORMATION DELAY, ELECTRON BEAM ACCELERATOR POWER AND HIGH POWER TUBE DESIGN (GYROTRON, VIRCATOR, CHERENKOV DEVICES, ETC.). APPLICATIONS INCLUDE VERY HIGH POWER RADARS AND JAMMERS, TACTICAL RF WEAPONS, POSSIBLE ASAT ROLE, PLASMA HEATING, AND MATERIALS TREATMENT AND FABRICATION.

SIC GROUP 36: ELECTRONIC AND OTHER ELECTRICAL EQUIPMENT AND COMPONENTS EXCEPT COMPUTER EQUIPMENT

TECHNOLOGY: LASER INSTRUMENTATION

A. DESCRIPTION

NONE STATED

B. TECHNOLOGY ADVANTAGES

LASER INSTRUMENTATION IS FINDING BROAD APPLICATIONS IN PRODUCTION FOR DRILLING, CUTTING, WELDING, AND THERMAL TREATING OF MATERIALS. ITS USE, IN MANY OPERATIONS, INCREASES LABOR PRODUCTIVITY BY THREE TO FOUR TIMES, AND THE DURABILITY OF STAMPS AND FORM PRESSES ON LASER INSTRUMENTATION IS TWO TO FOUR TIMES GREATER THAN WITH OTHER METHODS OF THERMAL TREATING.

SIC GROUP 36: ELECTRONIC AND OTHER ELECTRICAL EQUIPMENT AND COMPONENTS EXCEPT COMPUTER EQUIPMENT

TECHNOLOGY: MAGNETIC FLUX COMPRESSION GENERATORS

A. DESCRIPTION

THE C-320 EXPLOSIVE MAGNETOHYDRODYNAMIC GENERATOR IS A SPIRAL-WOUND, EXPLOSIVE-DRIVEN MAGNETIC FLUX COMPRESSION GENERATOR (FCG). THIS DEVICE CAN SUPPLY APPROXIMATELY 15 MJ OF ENERGY TO INDUCTIVE LOADS RANGING FROM 0.1 uH TO 0.6 uH.

B. TECHNOLOGY ADVANTAGES

THE C-320 GENERATOR CAN BE USED, WITH PULSE FORMING CIRCUITS, AS A DIRECT POWER SUPPLY FOR EXPERIMENTS OR, WITH SUITABLE COUPLING, TO SUPPLY THE INITIAL ENERGY OF ANOTHER EXPLOSIVE GENERATOR. THE TECHNOLOGY REPRESENTED BY THIS DEVICE CAN BE APPLIED TO VERY SMALL SYSTEMS THAT CAN BE TAILORED FOR PORTABILITY AS WELL AS EVEN LARGER GENERATORS TO PROVIDE >100 MJ OF ENERGY TO A SUITABLE LOAD.

SIC GROUP 36: ELECTRONIC AND OTHER ELECTRICAL EQUIPMENT AND COMPONENTS EXCEPT COMPUTER EQUIPMENT

TECHNOLOGY: MICROGRAVITY-PROCESSED ULTRA-PURE SEMICONDUCTOR SINGLE CRYSTALS

A. DESCRIPTION

THIS TECHNOLOGY ENCOMPASSES THE DEVELOPMENT OF MICROGRAVITY PRODUCTION OF ULTRA-PURE SINGLE CRYSTAL MATERIAL; OTHER HIGH PURITY MATERIALS INCLUDING GLASSES AND ALLOYS; HIGH PURITY POLYCRYSTALLINE MATERIALS INCLUDING OPTICAL QUALITY CERAMICS AND COMPOSITE MATERIALS ON MANNED OR UNMANNED EARTH SATELLITES.

B. TECHNOLOGY ADVANTAGES

MICROGRAVITY / SPACE ENVIRONMENT PROCESSING AND PURIFICATION OF MATERIALS RESULT IN ULTRA-HIGH PURITY MATERIALS.

SIC GROUP 36: ELECTRONIC AND OTHER ELECTRICAL EQUIPMENT AND COMPONENTS EXCEPT COMPUTER EQUIPMENT

TECHNOLOGY: PULSED POWER

A. DESCRIPTION

CRITICAL COMPONENT TECHNOLOGIES FOR PULSED POWER SYSTEMS INCLUDE FREQUENCY ENERGY STORAGE, PULSE FORMING (CONDITIONING) NETWORKS (PFN), AND PULSE TO LOAD COUPLING (e.g., LASER, HIGH-POWER MICROWAVE TUBE).

B. TECHNOLOGY ADVANTAGES

REVOLUTIONARY CHANGES IN BATTLEFIELD SCENARIOS ARE POSSIBLE BECAUSE OF MAJOR IMPROVEMENTS IN PULSED POWER TECHNOLOGY THAT ALLOW THE DEVELOPMENT OF HIGH-POWER WEAPONS AND SENSORS, INCLUDING DIRECTED ENERGY WEAPONS (DEW), KINETIC ENERGY WEAPONS (KEW), IMPROVED TARGET IDENTIFICATION AND SURVEILLANCE SYSTEMS, AND RAPID FIRE EARTH-TO-ORBIT (ETO) LAUNCHERS.

SIC GROUP 36: ELECTRONIC AND OTHER ELECTRICAL EQUIPMENT AND COMPONENTS EXCEPT COMPUTER EQUIPMENT

TECHNOLOGY: PULSED WAVE DI-ICING/ANTI-ICING EQUIPMENT

A. DESCRIPTION

THIS TECHNOLOGY MAKES USE OF ELECTROPULSES FOR DE-ICING AND ANTI-ICING SYSTEMS (PULSED WAVE EQUIPMENT). IT IS CONCERNED WITH THE REMOVAL OF HANGING AND STUCK LOOSE SUBSTANCES FROM THE INDUSTRIAL EQUIPMENT OF TRANSPORTATION ARTERIES, ALL KINDS OF HOPPERS, TANKS, AND DISPENSERS.

B. TECHNOLOGY ADVANTAGES

THIS TECHNOLOGY USES WAVE PULSES TO NOT ONLY REMOVE ICE FROM THE EDGE OF AN AIRCRAFT, BUT ALSO TO CONTROL ALL KINDS OF CONTAMINATES, WHICH ADHERE TO AND FREEZE OVER VARIOUS METALLIC SURFACES -- FOR EXAMPLE, THE WALLS OF RAILROAD CARS AND THE ROOFS OF BUILDINGS.

SIC GROUP 36: ELECTRONIC AND OTHER ELECTRICAL EQUIPMENT AND COMPONENTS EXCEPT COMPUTER EQUIPMENT

TECHNOLOGY: SPATIAL LIGHT MODULATORS

A. DESCRIPTION

THIS TECHNOLOGY ENCOMPASSES THE DEVELOPMENT OF OPTICAL SIGNAL PROCESSING DEVICES WHICH PERFORM DYNAMIC IMAGE SELECTION OF MOVING TARGETS, DIRECTIONAL FILTERING, AND AUTOMATIC EDGE ENHANCEMENT. THE SOVIETS HAVE ACHIEVED TECHNOLOGICAL SUPERIORITY IN THE DEVELOPMENT OF THESE DEVICES THROUGH A COMPREHENSIVE UNDERSTANDING OF MATERIALS AND HIGH-SPEED SIGNAL PROCESSING.

B. TECHNOLOGY ADVANTAGES

THESE DEVICES HAVE A NUMBER OF APPLICATIONS IN INFORMATION/IMAGE PROCESSING, INCLUDING PATTERN RECOGNITION ARCHITECTURES, WAVELENGTH CONVERSIONS, INPUT DEVICES FOR OPTICAL PROCESSORS, AND LARGE DISPLAY PURPOSES.

SIC GROUP 36: ELECTRONIC AND OTHER ELECTRICAL EQUIPMENT AND COMPONENTS EXCEPT COMPUTER EQUIPMENT

TECHNOLOGY: TACITRONS

A. DESCRIPTION

THIS TECHNOLOGY ENCOMPASSES THE DEVELOPMENT OF HIGH-TEMPERATURE ELECTRONICS BASED ON PLASMA CONDUCTING TUBES.

B. TECHNOLOGY ADVANTAGES

APPLICATIONS MAY INCLUDE LOW VOLTAGE SWITCHING OR RECTIFICATION IN HARSH TEMPERATURE ENVIRONMENTS, SUCH AS RECTIFIERS FOR ELECTROPLATING, ISOLATION AND POWER INVERTERS FOR HIGH-TEMPERATURE BATTERIES, PROCESSING OF HIGH PURITY RARE METALS, ALUMINUM PRODUCTION, AND VARIOUS "IN-CORE", RADIATION RESISTANT, HIGH TEMPERATURE, NUCLEAR APPLICATIONS SUCH AS POWER CONVERSION, SWITCHES, ETC.

SIC GROUP 36: ELECTRONIC AND OTHER ELECTRICAL EQUIPMENT AND COMPONENTS EXCEPT COMPUTER EQUIPMENT

TECHNOLOGY: VACUUM MICROELECTRONICS

A. DESCRIPTION

THIS TECHNOLOGY COMBINES SOLID STATE MICROELECTRONICS FABRICATION AND PROCESSING WITH VACUUM ELECTRON BALLISTIC TRANSPORT. THE CURRENT BASIS FOR THIS TECHNOLOGY IS THE FIELD EMITTER ARRAY (FEA) WHERE THE ACTIVE CHARGE TRANSPORT STRUCTURE IS A MINIATURE ELECTRON FIELD EMMITTER (500 ANGSTROM RADIUS) AND THE FUNDAMENTAL CELL DIMENSION IS ONE MICRON. TRANSPORT OF ELECTRONS FROM SOURCE TO DRAIN OCCURS IN A VACUUM.

B. TECHNOLOGY ADVANTAGES

ADVANTAGES OF THIS TECHNOLOGY INCLUDE OPERATION AT HIGH FREQUENCIES, RADIATION HARDENED, AND TEMPERATURE INSENSIVITY. THE SMALL SIZE OF THESE DEVICES MAKES THEM A POSSIBLE REPLACEMENT FOR VLSI AND VHSIC TECHNOLOGY. THE MOST LIKELY APPLICATION IS FLAT PANEL ARRAYS.

SOVIET COMMERCIAL TECHNOLOGIES

SIC GROUP 37: TRANSPORTATION EQUIPMENT

COMMERCIAL AIRCRAFT APPLICATION (IL-114, SUKHOI)
CRYOGENIC FUEL AIRCRAFT ENGINES
FAN-PROP AIRCRAFT ENGINES
GAS TURBINE HELICOPTER ENGINES
WING WITH INTERNAL FRAMEWORK (LATTICE CONTROL SURFACE OR GRID FIN)

SIC GROUP 37: TRANSPORTATION EQUIPMENT

TECHNOLOGY: COMMERCIAL AIRCRAFT APPLICATIONS

A. DESCRIPTION

THE SUKHOI DESIGN BUREAU HAS SIGNED JOINT VENTURE AGREEMENTS TO DEVELOP AND MANUFACTURE COMMERCIAL AIRCRAFT. IT HAS ALSO SIGNED A JOINT VENTURE TO DEVELOP A 50-SEAT, SUPERSONIC BUSINESS JET WITH GULFSTREAM AEROSPACE, WITH FIRST FLIGHT SLATED FOR 1993.

B. TECHNOLOGY ADVANTAGES

NONE STATED

SIC GROUP 37: TRANSPORTATION EQUIPMENT

TECHNOLOGY: CRYOGENIC FUEL AIRCRAFT ENGINES

A. DESCRIPTION

THIS TECHNOLOGY ENCOMPASSES THE DEVELOPMENT OF AN AIRCRAFT ENGINE ABLE TO USE LIQUID HYDROGEN OR LIQUID NATURAL GAS AS A FUEL. ON APRIL 15, 1988, A Tu-155 BECAME THE FIRST AIRCRAFT IN THE WORLD TO FLY ON CRYOGENIC FUEL. ON JANUARY 18, 1989, THE FIRST FLIGHT USING LIQUID NATURAL GAS WAS MADE.

B. TECHNOLOGY ADVANTAGES

THE USE OF CRYOGENIC FUELS WILL BE MORE ECONOMICAL AND WILL MAKE IT POSSIBLE TO REDUCE THE HARMFUL ECOLOGICAL EFFECTS OF AIRCRAFT ON THE ATMOSPHERE.

SIC GROUP 37: TRANSPORTATION EQUIPMENT

TECHNOLOGY: FAN-PROP AIRCRAFT ENGINES

A. DESCRIPTION

THIS TECHNOLOGY ENCOMPASSES THE DEVELOPMENT OF MORE ECONOMICAL FAN-PROP ENGINES HAVING ACCEPTABLE POWER. BY PROVIDING THE PROPELLERS WITH A LARGE NUMBER OF SHORT BLADES, A MARKED INCREASE IN SPEED HAS BEEN OBSERVED. RESEARCH IS ONGOING TO DETERMINE THE BEST POSSIBLE SHAPE FOR THE PROPELLER BLADES.

B. TECHNOLOGY ADVANTAGES

THIS TECHNOLOGY RESULTS IN MORE ECONOMICAL FUEL CONSUMPTION AND INCREASED RANGE.

SIC GROUP 37: TRANSPORTATION EQUIPMENT

TECHNOLOGY: GAS TURBINE HELICOPTER ENGINES

A. DESCRIPTION

THIS TECHNOLOGY ENCOMPASSES THE DEVELOPMENT OF A HELICOPTER WITH GAS TURBINE ENGINES CAPABLE OF USING ALTERNATIVE FUELS. AFTER DETAILED ANALYSIS IT WAS DECIDED TO PUT ASKT (CONDENSED AVIATION FUEL), IN LIQUID FORM UNDER LOW PRESSURE, IN UNINSULATED CYLINDRICAL TANKS. THESE AND OTHER DESIGN SOLUTIONS HAVE MADE IT POSSIBLE TO MODIFY AN EXISTING HELICOPTER ENGINE FOR GAS OPERATION WITHOUT RESORTING TO THE DEVELOPMENT OF A NEW ENGINE.

B. TECHNOLOGY ADVANTAGES

A MULTI-FUEL CAPABILITY WILL LESSEN LOGISTIC BURDENS.

SIC GROUP 37: TRANSPORTATION EQUIPMENT

TECHNOLOGY: WING WITH INTERNAL FRAMEWORK (LATTICE CONTROL SURFACE OR GRID FIN)

A. DESCRIPTION

THIS TECHNOLOGY ENCOMPASSES DEVELOPMENT OF INNOVATIVE AERODYNAMIC CONTROL DEVICES.

B. TECHNOLOGY ADVANTAGES

A WING WITH INTERNAL FRAMEWORK HAS CERTAIN ADVANTAGES OVER CONVENTIONAL AERODYNAMIC CONTROL DEVICES INCLUDING COMPACT STORAGE, LOW HINGE MOMENTS, DELAYED FLOW SEPARATION AND HIGH LIFT EFFECTIVENESS. IT HAS BEEN APPLIED TO HYDROFOILS AS WELL AS FLIGHT VEHICLES.

SOVIET COMMERCIAL TECHNOLOGIES

SIC GROUP 38: MEASURING, ANALYZING, AND CONTROLLING INSTRUMENTS: PHOTOGRAPHIC, MEDICAL AND OPTICAL GOODS

BIOCHROME FILMS
COOLED ACTIVE AND PASSIVE LASER MIRRORS
DIAMOND COATED SURGICAL INSTURMENTS
DIIODIDE OF MERCURY (HgI2) SENSORS
ELECTROANESTHESIA DEVICES
HOMOSORPTION FILTER TECHNOLOGY FOR TREATING POISON
JET INJECTION EQUIPMENT FOR IMMUNIZATION
LIDAR REMOTE SENSING
MICROSTRUCTURE LASER DEVICES
MONOPULSE TRACKING
PERFORMANCE ENHANCEMENT ELECTRICAL DEVICES
PHYSIOLOGICAL MEASUREMENT DEVICES
PSEUDORANDOM NOISE CODED WAVEFORM PROCESSING
RESIDUAL STRESS ENGINEERING MEASUREMENT DEVICES
VACCINE INHALATOR DEVICES

SIC GROUP 38: MEASURING, ANALYZING, AND CONTROLLING INSTRUMENTS: PHOTOGRAPHIC, MEDICAL AND OPTICAL

TECHNOLOGY: BIOCHROME FILMS

A. DESCRIPTION

THIS TECHNOLOGY ENCOMPASSES A FAMILY OF PHOTOCHROMIC FILMS MADE FROM A BIOLOGICAL MOLECULE CALLED BACTERIORHODOPSIN (BR) MIXED WITH SOME ADDITIONAL CHEMICALS -- POLYVINYL ALCOHOL, PHOTOGRAPHIC GELATIN, AND QUANIDINE HYDROCHLORIDE.

B. TECHNOLOGY ADVANTAGES

THE CHARACTERISTICS OF BIOCHROME VARIANTS ARE COMPETITIVE WITH OR EXCEED THOSE OF AVAILABLE NON-SILVER PHOTOCHROMIC MATERIALS. BIOCHROME'S DIFFRACTION-LIMITED RESOLUTION IS LIMITED BY THE AVAILABLE OPTICS TECHNOLOGY RATHER THAN BY THE FILM ITSELF.

SIC GROUP 38: MEASURING, ANALYZING, AND CONTROLLING INSTRUMENTS: PHOTOGRAPHIC, MEDICAL AND OPTICAL

TECHNOLOGY: COOLED ACTIVE AND PASSIVE LASER MIRRORS

A. DESCRIPTION

NONE STATED

B. TECHNOLOGY ADVANTAGES

NONE STATED

SIC GROUP 38: MEASURING, ANALYZING, AND CONTROLLING INSTRUMENTS: PHOTOGRAPHIC, MEDICAL AND OPTICAL

TECHNOLOGY: DIAMOND COATED SURGICAL INSTRUMENTS

A. DESCRIPTION

THIS TECHNOLOGY ENCOMPASSES THE DEVELOPMENT OF A PROCESS FOR COATING SURGICAL INSTRUMENT SURFACES WITH DIAMOND. SURFACE QUALITY AND DESIGN ARE IMPORTANT FOR GOOD SURGICAL INSTRUMENT PERFORMANCE.

B. TECHNOLOGY ADVANTAGES

DIAMOND FILM DEPOSITION INCREASES SURFACE WEAR AND LESSENS ABRASION AND CORROSION.

SIC GROUP 38: MEASURING, ANALYZING, AND CONTROLLING INSTRUMENTS: PHOTOGRAPHIC, MEDICAL AND OPTICAL

TECHNOLOGY: DIIODIDE OF MERCURY (HgI_2) SENSORS

A. DESCRIPTION

THIS TECHNOLOGY ENCOMPASSES THE DEVELOPMENT OF SENSORS MONITOR THE RADIOACTIVE CONTAMINATION OF HUMAN BEINGS AND THE ENVIRONMENT.

B. TECHNOLOGY ADVANTAGES

NONE STATED

SIC GROUP 38: MEASURING, ANALYZING, AND CONTROLLING INSTRUMENTS: PHOTOGRAPHIC, MEDICAL AND OPTICAL

TECHNOLOGY: ELECTROANESTHESIA DEVICES

A. DESCRIPTION

THIS TECHNOLOGY ENCOMPASSES THE APPLICATION OF ELECTRO-MAGNETIC RADIATION TO THE BODY TO PREVENT PAIN.

B. TECHNOLOGY ADVANTAGES

NONE STATED

SIC GROUP 38: MEASURING, ANALYZING, AND CONTROLLING INSTRUMENTS: PHOTOGRAPHIC, MEDICAL AND OPTICAL

TECHNOLOGY: HOMOSORPTION FILTER TECHNOLOGY FOR TREATING POISONS

A. DESCRIPTION

THIS TECHNOLOGY ENCOMPASSES THE DEVELOPMENT OF FILTERS THAT CAN BE USED TO REMOVE POISONS FROM THE BLOOD.

B. TECHNOLOGY ADVANTAGES

MORE EFFICIENT TREATMENT FOR POISON VICTIMS.

SIC GROUP 38: MEASURING, ANALYZING, AND CONTROLLING INSTRUMENTS: PHOTOGRAPHIC, MEDICAL AND OPTICAL

TECHNOLOGY: JET INJECTION EQUIPMENT FOR IMMUNIZATION

A. DESCRIPTION

THIS TECHNOLOGY IS DEVELOPING HIGH PRESSURE DEVICES WHICH DRIVE VACCINE PREPARATIONS THROUGH THE SKIN WITHOUT THE USE OF A NEEDLE.

B. TECHNOLOGY ADVANTAGES

THIS TECHNOLOGY WILL SPEED UP AND FACILITATE IMMUNIZATIONS.

SIC GROUP 38: MEASURING, ANALYZING, AND CONTROLLING INSTRUMENTS: PHOTOGRAPHIC, MEDICAL AND OPTICAL

TECHNOLOGY: LIDAR REMOTE SENSING

A. DESCRIPTION

THIS TECHNOLOGY ENCOMPASSES THE DEVELOPMENT OF AN EXTREMELY VERSATILE TOOL FOR REMOTE ANALYSIS OF THE ENVIRONMENT. THE SOVIETS ARE DEVELOPING LIDAR CAPABILITIES IN SPECTROSCOPY, REMOTE SENSING, NONLINEAR LASER-ATMOSPHERIC INTERACTIONS, ATMOSPHERIC TURBULENCE, AND AEROSOLS. ADDITIONALLY, THEY ARE DEVELOPING RAMAN, DIFFERENTIAL ABSORPTION LIDAR, LASER RECEPTION, FLUORESCENCE, AND NONLINEAR SPARK TECHNIQUES TO BETTER MEASURE THOSE PARAMETERS.

B. TECHNOLOGY ADVANTAGES

LIDARS DEVELOPED FOR POLLUTION SENSING CAN ALSO BE USED FOR THE DETECTION OF CHEMICAL AND BIOLOGICAL AGENTS AND NUCLEAR CONTAMINANTS. LIDAR MEASUREMENTS CAN ALSO BE USED FOR IMPROVED WEATHER OBSERVATION AND FORECASTING, CHARACTERIZATION OF THE ATMOSPHERE FOR LASER PROPAGATION, AND WIND AND DENSITY MEASUREMENTS FOR ACCURATE TARGETING.

SIC GROUP 38: MEASURING, ANALYZING, AND CONTROLLING INSTRUMENTS: PHOTOGRAPHIC, MEDICAL AND OPTICAL

TECHNOLOGY: MICROSTRUCTURE LASER DEVICES

A. DESCRIPTION

THIS TECHNOLOGY ENCOMPASSES THE USE OF LASERS TO CUT MOLECULES OF RNA AND DNA AT PREDETERMINED LOCATIONS.

B. TECHNOLOGY ADVANTAGES

THE USE OF LASERS POTENTIALLY CAN ALLOW GENETICISTS TO CAUSE BREAKS AT VIRTUALLY ANY POINT IN THE CHAIN, ALLOWING MUCH MORE FREEDOM IN PERFORMING GENETIC MANIPULATIONS.

SIC GROUP 38: MEASURING, ANALYZING, AND CONTROLLING INSTRUMENTS: PHOTOGRAPHIC, MEDICAL AND OPTICAL

TECHNOLOGY: MONOPULSE TRACKING

A. DESCRIPTION

THIS TECHNOLOGY CONSISTS OF A COMBINATION OF ANTENNAS WHICH FACILITATE ANGLE SENSING IN PHASE AND AMPLITUDE SIMULTANEOUSLY, PROVIDING ANGLE DISCRIMINATION IN RADAR.

B. TECHNOLOGY ADVANTAGES

NONE

SIC GROUP 38: MEASURING, ANALYZING, AND CONTROLLING INSTRUMENTS: PHOTOGRAPHIC, MEDICAL AND OPTICAL

TECHNOLOGY: PERFORMANCE ENHANCEMENT ELECTRICAL DEVICES

A. DESCRIPTION

THIS TECHNOLOGY ENCOMPASSES THE DEVELOPMENT OF PERFORMANCE ENHANCEMENT DEVICES SUCH AS THE LENAR AND THE ELECTRONARCON-1 TO COMBAT STRESS, FATIGUE, AND TIME-ZONE CHANGE PROBLEMS.

B. TECHNOLOGY ADVANTAGES

ELECTRIC CURRENTS CAN INDUCE SLEEP, RELIEVE FATIGUE FEELINGS, AND PERHAPS ASSIST IN OVERCOMING TIME-ZONE CHANGES AND STRESS.

SIC GROUP 38: MEASURING, ANALYZING, AND CONTROLLING INSTRUMENTS: PHOTOGRAPHIC, MEDICAL AND OPTICAL

TECHNOLOGY: PHYSIOLOGICAL MEASUREMENT DEVICES

A. DESCRIPTION

THIS TECHNOLOGY ENCOMPASSES THE DEVELOPMENT OF A SERIES OF DEVICES TO SELECT PERSONNEL AND MONITOR PERFORMANCE. THESE DEVICES MEASURE VISUAL MOTOR ACUITY AND OPERATIONAL MEMORY; EVALUATE TRAINING ON SIMULATORS; EXAMINE HEALTH; AND MONITOR THE SUBJECT'S CONDITION.

B. TECHNOLOGY ADVANTAGES

DEVICES THAT MEASURE PHYSIOLOGICAL RESPONSES ARE USED TO HELP SELECT PERSONNEL FOR VARIOUS OCCUPATIONAL SPECIALTIES AND IN MONITORING PERSONNEL PERFORMANCE.

SIC GROUP 38: MEASURING, ANALYZING, AND CONTROLLING INSTRUMENTS: PHOTOGRAPHIC, MEDICAL AND OPTICAL

TECHNOLOGY: PSEUDORANDOM NOISE CODED WAVEFORM PROCESSING

A. DESCRIPTION

THIS TECHNOLOGY ENCOMPASSES THE DEVELOPMENT OF A BI-PLANE SHIFT-KEYED RANDOM NOISE CODED WAVEFORM BY DELAY LINES AND HIGHLY UNAMBIGUOUS RADAR WAVEFORM GENERATORS.

B. TECHNOLOGY ADVANTAGES

THIS TECHNOLOGY IMPROVES ANALOG PROCESSING AND HAS POSSIBLE APPLICATIONS IN TAPPED DELAY LINE METHODOLOGY.

SIC GROUP 38: MEASURING, ANALYZING, AND CONTROLLING INSTRUMENTS: PHOTOGRAPHIC, MEDICAL AND OPTICAL

TECHNOLOGY: RESIDUAL STRESS ENGINEERING MEASUREMENT DEVICES

A. DESCRIPTION

THIS TECHNOLOGY HAS DEVELOPED A DEVICE FOR THE MEASUREMENT OF RESIDUAL STRESS.

B. TECHNOLOGY ADVANTAGES

THIS DEVICE IS USEABLE IN THE PRODUCTION ENVIRONMENT TO DETERMINE RESIDUAL STRESSES IN STRUCTURES.

SIC GROUP 38: MEASURING, ANALYZING, AND CONTROLLING INSTRUMENTS: PHOTOGRAPHIC, MEDICAL AND OPTICAL

TECHNOLOGY: VACCINE INHALATOR DEVICES

A. DESCRIPTION

THIS TECHNOLOGY DEVELOPS DEVICES WHICH CONVERT IMMUNIZING MATERIALS TO AEROSOL FORM WHICH THEN CAN BE INHALED.

B. TECHNOLOGY ADVANTAGES

THIS TECHNOLOGY WILL FACILITATE CIVILIAN AND MILITARY IMMUNIZATIONS.

SOVIET COMMERCIAL TECHNOLOGIES

SIC GROUP 47: TRANSPORTATION SERVICES

SPACE LAUNCH SERVICES
COMMERCIAL EXPERIMENTAL PAYLOAD SERVICES

SIC GROUP 47: TRANSPORTATION SERVICES

TECHNOLOGY: SPACE LAUNCH SERVICES

A. DESCRIPTION

THE COMPLETE RANGE OF SOVIET BOOSTERS IS AVAILABLE FOR LAUNCHING SATELLITES AND UNMANNED EXPERIMENTS INTO SPACE. SOVIET PRODUCED SATELLITES MAY BE PURCHASED, OR THEIR SERVICES LEASED.

B. TECHNOLOGY ADVANTAGES

THE TIME FROM PLACEMENT OF AN ORDER TO DELIVERY OF THE SATELLITE IN ORBIT TO THE CUSTOMER IS APPROXIMATELY 12-18 MONTHS. CUSTOMERS CAN ALSO ORDER CUSTOM DESIGNED SATELLITES.

SIC GROUP 47: TRANSPORTATION SERVICES

TECHNOLOGY: COMMERCIAL EXPERIMENTAL PAYLOAD SERVICES

A. DESCRIPTION

THE SOVIETS ARE OFFERING FLIGHT-PROVEN EXPERIMENT FACILITIES ON UNMANNED ORBITAL SATELLITES AND SUBORBITAL ROCKETS, AS WELL AS FACILITIES ABOARD THE MANNED SPACE STATION "MIR".

B. TECHNOLOGY ADVANTAGES

ABOARD "MIR", HIGHLY TRAINED COSMONAUTS CAN TEND MATERIALS SCIENCE/PROCESSING PACKAGES FOR THE CUSTOMER. ALTERNATIVELY, CUSTOMER PAYLOAD SPECIALISTS CAN VISIT THE SPACE STATION TO CONDUCT THE RESEARCH. THE SPLAV TECHNICAL CENTER PROVIDES THE ENGINEERING FACILITIES AND TECHNICAL EXPERTISE NEEDED TO BUILD EXPERIMENTAL DEVICES AND CONFIGURE THEM FOR INVESTIGATIONS ABOARD THE "MIR" AND "PHOTON" SPACECRAFT. TECHNICAL SPECIALISTS ARE AVAILABLE TO OFFER ANY NECESSARY PROCEDURAL ASSISTANCE TO CUSTOMERS.

SIC GROUP 49: ELECTRIC, GAS, AND SANITARY SERVICES

GEOTHERMAL ENERGY PRODUCTION TECHNIQUES

SIC GROUP 49: ELECTRIC, GAS, AND SANITARY SERVICES

TECHNOLOGY: GEOTHERMAL ENERGY PRODUCTION TECHNIQUES

A. DESCRIPTION

THIS TECHNOLOGY ENCOMPASSES THE DEVELOPMENT OF AN EXPERIMENTAL GEOTHERMAL ELECTRIC POWER PLANT USING A NEW TECHNOLOGY FOR THE EXTRACTION OF DEEP HEAT WITH AID OF UNDERGROUND CIRCULATION SYSTEMS.

B. TECHNOLOGY ADVANTAGES

NONE STATED

SIC GROUP 87: ENGINEERING, ACCOUNITNG, RESEARCH, MANAGEMENT, AND RELATED SERVICES

MAGNETOHYDRODYNAMIC-ACCELERATED (MHDA) SIMULATION

SIC GROUP 87: ENGINEERING, ACCOUNTING, RESEARCH, MANAGEMENT, AND RELATED SERVICES

TECHNOLOGY: MAGNETOHYDRODYNAMIC-ACCELERATED SIMULATION

A. DESCRIPTION

THE SOVIETS CONTRUCTED A PILOT MAGNETOHYDRODYNAMIC-ACCELERATED (MHDA) WIND TUNNEL WHICH BECAME OPERATIONAL IN 1976. BY 1982, THEY WERE ABLE TO ACHIEVE TEST CONDITIONS OF 7000 m/s, 30 pa, 600 deg K, EFFECTIVE TOTAL TEMPERATURE OF 10,000 deg K, AND EFFECTIVE TOTAL PRESSURE OF 5 mpa, WITH A TEST QUALITY CORE FLOW OF 18 BY 18 cm, AND A RUN TIME OF ABOUT 2 SECONDS.

B. TECHNOLOGY ADVANTAGES

MAGNETOHYDRODYNAMIC-ACCELERATED WIND TUNNELS PROVIDE AN EXCELLENT SIMULATION CAPABILITY IN A REAL GAS. THE SYNERGISTIC EFFECT OF HAVING A REAL GAS ENVIRONMENT AT ALTITUDE, TEMPERATURE, AND VELOCITY BECOME SIGNIFICANT IN THE ACCURACY OF CORRELATING WIND TUNNEL DATA TO COMPUTER FLUID DYNAMIC (CFD) MODELING. THE MORE ACCURATE THE WIND TUNNEL SIMULATION CONDITIONS, THE BETTER THE COMPUTER MODEL WILL BE FOR DESIGNING HYPERSONIC VEHICLES.